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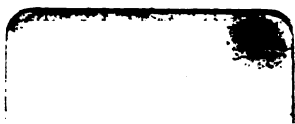
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**EDUCATION DEPARTMENT.**

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**ON THE**

**PHILADELPHIA INTERNATIONAL EXHIBITION**

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# INDIA.

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## INDIA.

British India occupies an area of nearly  $1\frac{1}{2}$  millions of square miles, and contains about 240 millions of inhabitants. The greater part of the country is placed directly under British administration, whilst the remaining portion continues under the rule of different native princes, who, however, all acknowledge the supremacy of the British Crown. The exact figures are as follows :—

	Area.	Population.
	Square miles.	Inhabitants.
Provinces under British administration	- 897,004 -	189,613,238
Native States	- 589,315 -	50,325,457
<b>Total British India</b>	<b>- 1,486,319 -</b>	<b>239,938,695</b>

Area, population, and Government.

The new era of India opens with the transfer of its government from the old East India Company to the British Crown, the announcement of which was publicly proclaimed on the 1st of November 1858, immediately after the suppression of the mutiny. The title of "Empress of India," assumed by proclamation on the 1st of January of the current year, is only a sequel to the first step taken in 1858, and is the outward symbol of the indissoluble connexion between India and the British Crown.

Moral and material progress of India since the transfer of the Government from the East India Company to the British Crown in 1858.

During the 20 years which have elapsed since the outbreak of the mutiny, India has undergone a profound transformation. Two causes—one a moral, the other a material one—have mainly contributed to bring about this result. These causes are, first, the gradual progress of education, and, second, the extraordinary development of means of communication. If we compare the year 1857, the last before the mutiny, with the present state of things, we find that the progress made in both these directions has been very great.

As regards education, the total expenditure on that account, as far as the Government is concerned, amounted in 1857 to 231,479*l.*, whereas the estimated expenditure in 1877 is more than four times as large, amounting to 1,044,130*l.*, whilst the number of pupils, which in 1857 hardly reached 200,000, amounts now to about 1,700,000, and is rapidly increasing. Such numbers, though they appear small when measured by the standard of civilised countries, conclusively prove that education is already beginning to affect the masses. They also indicate an extraordinary progress in so short a time, and compare very favourably with the condition of other semi-civilised countries. Thus Russia possesses not much more than one-half the number of the pupils in Indian schools, and even taking into account the difference of population, the Indian numbers compare not unfavourably with the Russian ones, the school attendance in both countries amounting in most of the provinces to a little below 1 per cent. of the population.

Educational progress.

Number of pupils.

Comparison with Russia.

The progress of education is also shown by the yearly increasing number of graduates issuing from the three Indian Universities of Calcutta, Bombay, and Madras, established in 1857 at a time when India was in the very throes of the mutiny, as also by the large number of pupils in the special engineering, art, and medical schools. Equally striking is the rapid growth of the native press and literature.

Universities.

Engineering, art, and medical schools.

Native press and literature. Development of means of communication.

Notwithstanding, however, the great progress which has been effected, education has hitherto had a smaller share in bringing about the changes wrought in India during the 20 years under discussion, than the other cause just mentioned, namely, the development of the means of communication. Although in the end the results which will follow from the introduction of European ideas and civilisation will be the most far-reaching and abiding of the changes produced by the English administration of India, it is yet true that the results which have hitherto been obtained are valuable chiefly as the

promise of a better future, and that the full advantages will be perceived only when the present generation shall have grown up. The changes brought about by improvement in the means of communication have been, on the other hand, almost instantaneous, and have already transformed the whole face of the country.

The progress effected since 1857 in this respect is shown by the following figures:—

*Railways:—*

	1876.	1857.
Length of, open - - -	6,497 miles	274 miles.

1875.

Number of passengers carried	- 26,779,000	- 1,825,000
Quantity of goods carried	- 4,389,000 tons.	
Gross receipts - - -	- 7,412,000 <i>l</i> .	- 198,000 <i>l</i> .
Net receipts - - -	- 3,648,000 <i>l</i> .	- 116,000 <i>l</i> .

*Telegraphs:—*

Length open - - -	- 16,649 miles -	4,162 miles.
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*Post Office:—*

No. of letters and packets conveyed	116,119,000	- 28,798,000
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Opening of the Suez Canal.

Equally important in this respect was the opening of the Suez Canal, which took place on the 18th December 1869, a date which marks a turning point in the trade not only of India, but of the East generally.

The influence which all these circumstances have exercised upon the development of the country is manifested both in its finances and its trade, as the following figures show. First, as regards finance:—

Finance, 1857 and 1877.

	1877.	1857.
	<u>£</u>	<u>£</u>
REVENUE: Imperial - -	51,221,000	
Provincial - - -	4,201,000	
	<u>55,422,000</u>	31,691,000
EXPENDITURE:		
Imperial (estimate for 1877, inclusive of Famine Relief)	53,079,000	
Provincial, in excess of the Imperial assignments (estimate) - -	4,538,000	
Extraordinary Expenditure on account of remunerative Public Works (estimate) - - -	3,765,000	
	<u>61,382,000</u>	<u>31,609,000</u>

Causes of excess of expenditure over revenue.

Both the revenue and the expenditure have almost doubled in the 20 years. It will be noticed that the estimated expenditure in the year 1877 shows a considerable excess over the revenue. This is due partly to the large expenditure on account of remunerative public works, which it is only fair should be paid for out of borrowed money, and partly also to the extraordinary expenditure of nearly two millions, occasioned by the famine now raging in Southern and Western India. It must also be observed that there is a large expenditure on account of public works which is not provided for by loans, but paid out of the current revenues, so that the whole sum which has been estimated for the public works in 1877 amounts to 8,122,254*l*. In fact, by adding together the cost of public works ordinary and extraordinary, the cost of education (1,044,000*l*.) already mentioned, together with that of the trigonometrical, geological, and other surveys, and other scientific operations undertaken by the Government, we obtain a sum of about 10,000,000*l*., which

is now being yearly spent by the Government in India for the permanent improvement of the country and its people.

The trade and shipping returns prove that the increase of both the public revenue and expenditure has been accompanied by a still greater increase in the wealth and prosperity of the country.

The shipping has increased in the following proportions :—

Shipping, 1857  
and 1875.

Tonnage of foreign and coasting trade :—

	1875.	1857.
	Tons.	Tons.
Entered - - -	4,904,000	2,207,000
Cleared - - -	4,983,000	2,342,000
Total tonnage	<u>9,887,000</u>	<u>4,549,000</u>

The value of exports and imports\* has increased in even greater proportion :—

Exports and  
imports, 1857 and  
1877.

	1877.	1857.
	£	£
Imports (including treasure)	48,697,000	28,608,000
Exports (including treasure)	62,975,000	26,591,000
	<u>111,672,000</u>	<u>55,199,000</u>

These figures include treasure as well as merchandise, but it will be instructive to separate these two items. The data referring to the import and export of treasure are so interesting in themselves that the details for each of the 20 years of the period 1858–77 have been inserted in the following table :—

Exports and  
imports of  
treasure, 1858 to  
1877.

	Imports.	Exports.
	£	£
1858 - - - -	15,815,436	822,438
1859 - - - -	12,817,071	669,427
1860 - - - -	16,356,963	929,007
1861 - - - -	10,677,077	1,119,549
1862 - - - -	14,951,985	683,355
1863 - - - -	20,508,967	1,111,140
1864 - - - -	22,962,581	1,270,435
1865 - - - -	21,363,352	1,444,775
1866 - - - -	26,557,301	2,165,352
1867 - - - -	13,229,533	1,950,435
1868 - - - -	11,775,374	1,025,336
1869 - - - -	14,366,588	776,082
1870 - - - -	13,954,807	1,025,386
1871 - - - -	5,444,823	1,587,180
1872 - - - -	11,573,813	1,421,173
1873 - - - -	4,556,585	1,273,979
1874 - - - -	5,792,534	1,879,071
1875 - - - -	8,141,047	1,592,722
1876 - - - -	5,300,722	2,115,145
1877 - - - -	11,436,118	3,942,580
Total - - -	<u>267,582,677</u>	<u>28,804,567</u>

Excess of imports of treasure over exports 238,778,110*l*.

The net increase of the precious metals in India during this period thus amounts to the extraordinary total of 238,778,110*l*., or an increase of, as nearly as possible, one pound sterling for each head of population in the whole of British and Native India.

\* The figures for 1877 are taken from the monthly returns, and are liable to slight corrections in the final returns for the year.

Exports and imports of merchandise, 1857 and 1877.

The comparative figures of exports and imports of merchandise, excluding treasure but including Government stores, are as follows :—

	1877.	1857.	Percentage Increase from 1857 to 1877.
Imports of merchandise	£ 37,260,000	£ 14,195,000	163%
Exports " "	£ 59,032,000	£ 25,388,000	133%
	£ 96,292,000	£ 39,533,000	140%

Thus the exports of Indian produce and manufacture during this period of 20 years have increased 133 per cent., the imports of foreign merchandise 163 per cent., and the total trade by about 140 per cent.

Stationary character of the old branches of Indian trade.

Exports of raw and manufactured silk declining.

But not only has the trade increased in volume; it has completely changed in character. Nothing is more striking, in looking over the trade returns, than the rapid development of new branches of trade, whilst many of the old staple articles of Indian trade continue stationary, or are even declining. Thus silk and silk manufactures, which formerly constituted such an important item in the Indian exports, have rather declined, the numbers being :—

	1877.	1857.
	£	£
Exports of raw silk	- 777,000	782,000
" " silk manufactures	- 224,000	281,000
	<u>£1,001,000</u>	<u>1,063,000</u>

Imports increasing.

Not only have the exports declined in this respect, but the imports of foreign silk and silk manufactures have largely increased, being now more than four times as large as in 1857 :—

	1877.	1857.
	£	£
Imports of raw silk	- 452,000	120,000
" " silk manufactures	- 585,000	106,000
	<u>£1,037,000</u>	<u>226,000</u>

Decrease in export of Cashmere shawls and woollen manufactures; likewise in saltpetre; also in sugar.

Thus during the current year there has actually been more silk and silk manufactures imported into India than exported from it.

The same decrease can be observed in the export of Cashmere shawls and other woollen manufactures, the numbers being 291,000 in 1857 and only 216,000 in 1877.

A decrease may also be noticed in another characteristic Indian product, viz., saltpetre, of which the value exported in 1857 amounted to 576,000 against 382,000 in 1877.

Sugar also has largely decreased, the value exported in 1857 being 1,786,000, or above 7 per cent. of the entire exports, whereas in 1877 it only amounted to 925,000, or only a little more than 1½ per cent. of the exports, whilst during the same year colonial sugar to the value of 404,000 was imported into India. But although there have been several years during which India has actually imported more sugar than she has exported, the figures for 1877 already point to a recovery in the trade in this article. India has thus been beaten by Mauritius and the other plantation colonies, in the international competition for the sugar trade, but her internal consumption of sugar is enormous, and its cultivation still continues to hold the first rank in Indian agriculture as the most valuable crop, the various grain crops only

Enormous home consumption of sugar.

excepted. The best ground is devoted to it; whatever manure the ryot may possess is applied to it in preference to other crops, and the total value of the sugar and molasses annually produced in India will probably not be less than about 20,000,000*l.*, or considerably more than the actual value of the cotton crop.

Moderate increase in export of some of the other old Indian staple products.

A few of the remaining old Indian staples, such as drugs, spices, lac, with indigo, and other dyes show a moderate increase, which is, however, considerable only in the case of lac, the exports of which have increased almost sixfold during the period referred to:—

	1877.	1857.
	£	£
Drugs - - - -	54,000	91,000
Spices - - - -	266,000	104,000
Lac dye, and lacs - - -	600,000	106,000
Indigo - - - -	2,963,000	1,938,000
Other dyes - - - -	274,000	87,000
<b>Total - - - -</b>	<b>4,157,000</b>	<b>2,326,000</b>

There has been on the whole an increase in the value exported, but the proportionate importance of this group as compared with the whole volume of trade has declined, being about 9% in 1857 and only 7% in 1877.

While most of the old staple articles of Indian commerce have been thus either falling off or remaining stationary, or else have only moderately increased, a gigantic trade has sprung up in articles which were formerly of very small importance. These belong mainly to three different classes: (1.) the bulky agricultural produce, which in consequence of the improved means of communication can now be thrown upon the markets of Europe; (2) raw textiles; and (3) several exotic products recently acclimatised in India through the instrumentality of European capital and enterprise.

Extraordinary development of new branches of trade.

#### *First Group.*

The trade in grains and seeds of all kinds sprang up about the time of the Crimean War in consequence of the closing of the Russian ports, from which the main supply had previously been derived.

Trade in grains and seeds from 1857 to 1877.

From 1857 to 1877, the following changes have taken place:—

—	1877.	1857.	Increase per cent.
<b>GRAINS:</b>	<b>£</b>	<b>£</b>	
Rice - - - -	5,815,000	2,301,000	153
Wheat - - - -	1,956,000	138,000	1320
Other grains - - - -	117,000	148,000	—
<b>Total Grains - - - -</b>	<b>7,888,000</b>	<b>2,587,000</b>	<b>206</b>
<b>OIL SEEDS AND OIL:</b>			
Oil seeds - - - -	5,319,000	1,119,000	376
Oil - - - -	353,000	179,000	100
	5,672,000	1,298,000	340
<b>Total Grains and Seeds - - - -</b>	<b>13,560,000</b>	<b>3,885,000</b>	<b>274</b>

The total trade in grains and seeds has thus increased in 20 years by about 274 per cent., and in actual figures from 3,885,000*l.* to 13,560,000*l.*, and now constitutes 23 per cent. of the entire exports as compared with 16 per cent. in 1857. The most extraordinary development is shown by the trade in wheat, which after being stationary for a great number of years has sprung up suddenly during the last few years, attaining last year a figure of almost two millions sterling.

Increase in 20 years.

Trade in hides and skins, 1857 and 1877.

Allied with agricultural produce is the trade in hides and skins, which likewise shows a considerable progress:—

	1877.	1857.
	£	£
Exports of hides and skins - - -	2,999,000	573,000

Opium.

The exports of opium have also increased, although the high figures are due not so much to its prime cost, as to the duties placed upon it:—

	1877.	1857.
	£	£
Exports of opium - - -	12,405,000	7,057,000

#### Second Group.

Animal and vegetable fibres.

The second group embraces the vegetable and animal fibres which now form the most important item in the Indian exports, viz., cotton, jute, and wool. Of these, cotton alone belongs to the old staple articles of Indian trade, although its exports never attained any considerable importance in the olden time. Shortly after the Crimean war the exports began to increase, until the American civil war suddenly made India the chief source of the supply of cotton. During the progress of the cotton famine the prices were raised to such a height, that the values of the Indian exports of cotton increased even more rapidly than the quantities, and in 1865 the exports attained the enormous value of 37,573,637*l*. Since then the values have fallen steadily and rapidly, though the quantities have been very fairly maintained, and cotton still preserves its position as one of the most important articles of Indian trade. Jute is remarkable chiefly as being an article the trade in which has been entirely created during the last 30 years, and although temporarily depressed it has still a great future before it. The development of the wool trade is likewise comparatively recent. The growth of the trade in textile raw materials from 1857 to 1877 is shown below:—

	1877.	1857.
	£	£
Exports of raw cotton - - -	11,746,000	1,438,000
„ jute - - -	2,637,000	275,000
„ wool - - -	1,077,000	314,000
Total - - -	15,460,000	2,027,000

#### Third Group. or an increase of 660 per cent.

Coffee and tea.

The third group of the new growth of Indian export trade, viz., the exports of recently acclimatised exotic products, is, perhaps, the most interesting. The following figures show its startling development:—

Immense development of production and export, 1857 to 1877.

	1877.	1857.
	£	£
Exports of coffee - - -	1,346,000	133,000
„ tea - - -	2,607,000	121,000
Total - - -	3,953,000	254,000

Chinchona and other products.

Or an increase of 1456 per cent. The importance of the present tea plantations in India may be best gathered from the fact that the production of tea in that country during the past year is equal to the total quantity of tea annually consumed in the United Kingdom so late as the year 1840. Another exotic, the Chinchona, promises to become soon important. Although introduced into India by Mr. Clements Markham so late as 1861, there are now nearly three millions of trees in the different plantations in India, and the Government sales of bark during the past year have amounted to 29,000*l*.

There are also several other Indian products which begin to attract attention, and although as yet of no great importance, the past history of Indian commerce shows how quickly a trade may now spring up and attain very considerable dimensions. Among such products may be mentioned tobacco, the exports of which in 1874-75 have risen to 215,000*l.*, although in the current year there is a falling off to 75,000*l.* Another product is India-rubber, the exports of which in 1877 amounted to 90,000*l.*

Tobacco.

India-rubber.

The returns of imports during the same period show how greatly the consuming power of India has increased. The principal articles are cotton yarn and cotton piece goods, woollens, metals and metal manufactures, machinery and mill work, railway materials, and lastly, beer, wines, and spirits. In respect to several of these articles a considerable progress has been made in establishing manufactures for their indigenous supply, a large and rapidly increasing number of cotton-mills being already established in Bombay and other parts of India, and successful attempts in the manufacture of iron on the European method having been recently made, whilst the out-put of coal in the Indian coal mines has considerably increased of late, and already supplies some of the Indian railways with the whole of the fuel required. The following numbers show the progress since 1857 :—

Growth of the  
import trade.  
Principal  
articles.  
Establishment  
of cotton-mills.

Statistics of  
imports in 1857  
and 1877.

	1877.	1857.	Increase.
	£	£	
Apparel - - -	543,000	364,000	49 per cent.
Cotton twist and yarn - - -	2,733,000	1,192,000	129 "
Cotton manufactures - - -	15,993,000	4,941,000	224 "
Woollen manufactures - - -	912,000	144,000	533 "
Metals and metal manufactures - - -	4,275,000	1,685,000	161 "
Machinery and millwork - - -	958,000	244,000	292 "
Railway materials - - -	1,070,000	951,000	—
Beer, wines, and spirits - - -	1,563,000	620,000	151 per cent.
Salt - - -	431,000	301,000	—

It is interesting to observe that in addition to cotton goods, the imports of woollen manufactures have already reached very nearly one million sterling, and are fast becoming an important article of trade. The large increase in metals and metal manufactures, as also in machinery and mill-work, is specially important, whilst the increase in wine and spirits is largely due to the increased number of Europeans now residing in India.

General increase  
in the consump-  
tion of fabrics.

This brief review of the progress of Indian trade from 1858 to 1877 is instructive, for it shows that India, known usually as the country of caste and immutable tradition, shows herself possessed, under her present rule, of a remarkable power of expansion as regards trade and commercial development. Although several political occurrences, such as the Crimean war and the cotton famine, have contributed much to foster the recent growth of her commerce, yet the steady development of trade continued after these occurrences passed away, and within a single generation trades have been created, each of which may now be measured by millions sterling. It must also be remembered that the figures included in the trade returns refer only to the seaborne trade, whereas of late years the land trade with Central Asia and Thibet has been acquiring some importance. If once the communication with these countries and also with China is improved, we may expect a considerable increase of trade in these directions.

J. FORBES WATSON,  
Reporter on the Products of India,  
and Director of the India Museum.

India Office,  
June 1877.

DESCRIPTIVE CATALOGUE of the COLLECTIONS SELECTED from the INDIA MUSEUM, LONDON, and EXHIBITED in the INDIAN DEPARTMENT of the PHILADELPHIA CENTENNIAL EXHIBITION of 1876, under the SUPERINTENDENCE of the BRITISH EXECUTIVE COMMISSIONERS.

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## DEPARTMENT I.—MINING AND METALLURGY.

## MINERALS, ORES, &amp;c. Class 100.

## Iron Ores.

Iron ores exist in great abundance throughout the Indian Peninsula, and are widely distributed; with the exception of the trap area and the alluvial plains, there are few districts where deposits have not been found. The quality is in most cases excellent.

Among the most remarkable deposits are those of magnetic iron ore existing in the neighbourhood of Salem in the Madras Presidency: here beds of ore from 50 to 100 feet in thickness can be traced for miles. On a hill in this district there are five bands of magnetic ore from 20 to 50 feet in thickness running completely round the hill, which is four miles in length. At Lohara, in the Chanda district, Central Provinces, there is a hill nearly two miles long and half a mile broad, apparently formed entirely of an extremely pure ore, a mixture of magnetic and specular ore (see specimen No. 31). This would probably yield 300,000 to 500,000 tons of iron, without going below the surface. Limestone and coal occur near this deposit, which is likely to become of more than local importance. The ores of Bundelkund and the Nerbudda Valley are chiefly hæmatites. In the Ranigunj coal field, and other coal fields of the Damuda Valley, clay iron ores abound, containing on an average nearly 40 per cent. of iron.

*From the Madras Presidency.*

- Magnetic iron ore. Travancore.
- Hæmatite. Travancore.
- Iron ochre. Travancore.
- Silicious hæmatite. Pudukota.
- Magnetic iron ore. Beypoor. Malabar. Used in making Indian Bessemer steel.
- Magnetic iron ore. Honore. Malabar. Used in making Indian Bessemer steel.
- Magnetic iron ore. Mysore.
- Magnetic iron ore. Mysore.
- Hæmatite. Shikarapore. Shimoga. Mysore.
- Silicious hæmatite. Anantapore. Shimoga. Mysore.
- Hæmatite. Murdium. Mysore.
- Hæmatite. Tumkur. Mysore.
- Hæmatite. Mudgeri. Mysore.
- Hæmatite. Hassan. Mysore.
- Fibrous limonite. Mysore.
- Magnetic iron ore. Moorakcully. Salem.
- Magnetic iron ore. Salem.
- Magnetic iron ore. Salem. Rusting on surface.
- Magnetic iron ore. Salem.
- Magnetic iron ore. Salem. In transition to peroxide.
- Magnetic iron ore. Salem.
- Hæmatite. Palamcottah. Tinneveli.
- Brown hæmatite. Arreanathum. South Arcot.
- Magnetic iron ore—oxidising. Madras.
- Magnetic iron sand. Sautghur Talook. North Arcot.
- Magnetic iron sand. Nimmanapully. Congoondy Talook. North Arcot.
- Magnetic iron sand. Vellore. North Arcot.
- Magnetic iron sand. Anchenamput. Vellore.

*From the Bombay Presidency.*

- Iron ore. Poona.
- Iron ore. Mahableshwar.

*From the Bengal Presidency.*

Magnetic and specular iron ore. Pipalgaon. Chanda. Central Provinces.

This ore is similar in appearance and composition to the Lohara deposit already alluded to. An analysis of the Lohara ore gave 90·32 per cent. of ferric oxide and 8·26 of magnetic oxide, together equal to 69·20 per cent. of metallic iron. It contained but ·012 per cent. of sulphur, ·005 of phosphorus, and ·823 of silica.

Hæmatite. Tendukera. Saugor and Nerbudda territory.

Hæmatite. Mungrownee. Gwalior. Central India.

Iron ochre. (*Dhaoo*.) Gwalior. Central India.

Hæmatite. Malwa.

Clay iron ore. Tehree. Bundelkund.

Hæmatite. Nerbudda Valley.

Hæmatite. Nerbudda Valley.

Magnetite. Chota Nagpur. Found lying on the high grounds in this state.

Magnetic iron sand. Kot Kai. Himalayas.

Magnetic iron ore. Assam.

Brown hæmatite. Luckimpore. Upper Assam.

Clay iron ore. Gellaka Mouzah. Sebsaugor. Assam.

Magnetic iron sand. North-east Assam.

Bog iron ore. Rangoon. British Burmah.

Crude iron. Assam.

Wootz steel.

Native iron.

Native iron.

Native iron with slag, partially fused.

Laterite. Travancore.

Laterite. Mysore.

This remarkable rock is widely spread through the Peninsula, and occurs also in Ceylon, Burmah, Malacca, and Siam. It caps the summits of the Eastern and Western Ghats. Under the surface it is soft, and when first exposed can be cut with a spade, but it hardens on exposure to the air, the iron, which in the interior is usually in the form of magnetic oxide, becoming converted into brown hæmatite. The oxide of iron is often accompanied by manganese as pyrolusite. The per-centage of iron sometimes reaches 30 or more, when the rock may be used as a source of iron; it is, however, commonly employed for road metalling and as a building material, for which latter purpose, when carefully selected, it is admirably suited. Many opinions have been held as to its origin and age. The true laterite seems to have been formed by the subaërial decomposition of trap or gneiss rock, but no one theory accounts for laterite in all its positions, or satisfactorily for the sources whence the large amount of iron is derived.

Iron pyrites, crystalline and cut into ornaments.

*Chromium Ore.*

Chrome iron ore is found in considerable quantity in Salem, forming a vein in the central part of a tract of country, about 10 square miles in area, covered by magnesite veins.

Chrome iron ore. Salem.

Chrome iron ore. South Arcot.

*Manganese Ores.*

Manganese ores, viz., pyrolusite, wad, and psilomelane, are found in the Wardha coal field, Central Provinces, in the Punjab, Burmah, and several localities in the Madras Presidency.

Manganese ore.

Manganese ore.

*Copper Ores.*

Copper has been found and worked on a small scale by the natives in many parts of India. The principal mines are those in Kumaon, Gurhwal,

Nepal, Darjiling, Jaipur in Rajputana, and in Dalbhum and Singbhum. The production of metal is very small.

Carbonate of copper. Nellore. Madras.

Copper glance with chesylite. Singbhum. Lower Provinces.

Copper ore; impure carbonate of copper. Singbhum. Lower Provinces. Contains 2½ ounces of silver to the ton of ore.

Copper glance with blue and green carbonates. Deoghur. Birbhum.

Copper and lead ore. Deoghur. Birbhum.

Malachite. Central India.

Copper pyrites. Hills of Beluchistan. Upper Sind.

#### Lead Ores.

Galena, usually associated with copper, is found in Kulu, Gurhwal, and Sirmur, in the north-west Himalayas, and in Ajmir, Manbhum, Kárnul, and Kuddapah, at Sabathu in the Simla district, and at Chicoli near Raipur in the Central Provinces. Silver is generally contained in the ore, but in very varying quantities. An assay of the Chicoli ore gave silver equal to 9 oz. 19 dwts. 6 grns. per ton, of the Manbhum ore silver equal to 119 oz. 4 dwts. 16 grns. per ton. A sample of antimonial galena from Chota Nagpur contained 70 oz. silver per ton, while another sample from the same locality contained no silver.

Galena with copper pyrites. Malanna Mine. Kulu Valley. Kangra. Analysis gave 57·32 per cent. of lead and 8·10 per cent. of copper.

Galena. Parbutti Mine. Kulu Valley. Kangra. Contains 60·4 per cent. of lead, with traces of silver, copper, and arsenic.

Galena. Catloor near Kuddapah. Contains silver.

Galena. Karnul.

Galena. Chota Nagpur.

Galena. Duttiah. Bundelkand.

Galena. Hazaribagh. Lower Provinces. Occurs sparingly disseminated through a garnet (calderite) and augite rock.

Galena. Found on the surface of the soil on the hills of Beluchistan. Upper Sind.

#### Antimony Ores.

Stibnite (Antimonite) is found in Kulu and Lahoul, in the latter district at Shigri on the Chandra River. In one of the two lodes at Shigri there is 20 feet of solid ore in the middle of the lode, which is 40 feet in width, and little or none of the gneiss rock, in which it occurs, is associated with the ore. On the surface the products of oxidation, kermesite and cervantite, occur. Stibnite is found also in Borneo. It is called by the natives *surma*, and is used as a cosmetic for the eyes; the *surma* of the bazaars, however, often consists of galena or even iron or manganese ores.

Stibnite. Shigri. Lahoul.

Stibnite. Busoh.

Stibnite. Borneo.

Stibnite. Sarawak.

#### Tin Ore.

Rich deposits of tin stone occur in the Tenasserim provinces, British Burmah, and throughout the Malayan Peninsula and its adjacent islands. These latter deposits are well known, and have been long worked; they appear to become richer towards the southern termination of the tin area in the islands of Banca and Billiton.

In the Tenasserim provinces deposits of stream tin occur in most of the streams which carry down the debris from the granite mountains separating British Burmah from Siam. The tin was worked extensively before the Burmese took possession, and traces of the work of thousands of men are visible in the beds and on the banks of these rivers. At Kuhun, 11 miles from Mergui, on the right bank of the Tenasserim River, crystals of cassiterite, associated with chlorite, occur in a granite vein running through a low hill of sandstone; in the other known localities the ore occurs as stream tin in detrital

gravel. These deposits are not worked owing to the wildness of the country, the thinness of population, and absence of means of carriage. Near the village of Rinowng, in Siam, just beyond the British boundary, somewhat extensive workings are carried on. In the Indian Peninsula tin has been reported in various places, but from only one locality is anything accurate known of its occurrence. In North Hazaribagh, tin stone was found in three or four lenticular nests in the gneiss rock, but the working was abandoned after a short time, very little tin having been produced.

Tin stone. Junk Ceylon or Salang Island.

Rubble rich in tin ore. Macham Baboo. Province Wellesley.

Alluvial soil containing tin-stone. Malacca.

Tin stone. Malacca.

Tin stone. Kuhun.

Tin stone. Kuhun.

Tin stone. Mergui.

Tin stone. Tenasserim.

Tin stone. Larut. Perak.

Tin stone in quartz. Johore.

Tin stone. Johore.

Tin stone. Johore.

#### Gold Ore.

Gold occurs in many parts of India in the stream gravels, but always in very small quantities; only the poorest of the natives are occupied in washing for it. It is extracted in some parts of the Punjab, in Chota Nagpur, Manbhum, Singbhum, the Godavari Valley, and a few places in Southern India, and in Assam and Burmah.

The Malabar district has been noted for gold from time immemorial. Two tribes of people obtained it, one from the alluvium, &c., and the other from quartz "leaders" in the hill country. It is also found on the sea shore about Bepoor. Several auriferous quartz reefs occur in the Wynad. Preliminary trials on different reefs gave an average proportion of 7 dwts. of gold to the ton of ore, this matrix gold containing 86·86 per cent. of pure gold. The alluvial gold of the same district contains 91·95 per cent. of pure gold.

Gold sand. Puralia. Chota Nagpur.

Gold sand. Toradanally, Dhenkanal, Cuttack Tributary Mehals.

Gold sand. Dandput, Keonjhur, Cuttack Tributary Mehals.

Gold sand deposited at the mouth of Martaban stream, a tributary of the Shoay Gyeen River. Rangoon.

Gold sand. Ramagherry, Colar district. Mysore.

#### Arsenic.

Orpiment (*Harital*) is found in the northern parts of the Kumaon district as well as in Burmah, &c.

Preparations of arsenic enter largely into the composition of native drugs, and are extensively used both medicinally and criminally.

Orpiment. Pegu.

Orpiment. Burmah.

Orpiment. Tenasserim.

Realgar (*Manavasala*). Bengal.

Crude arsenic. Madras.

#### Graphite.

Graphite is found in workable quantities in Travancore, Kumaon, Ceylon, and Sikkim.

Graphite from the bottom of a laterite hill at the base of the Ghats. Caviatten Coodul.

Graphite. Trevandrum. Travancore.

Graphite, washed. Trevandrum. Travancore.

Graphite in laterite, found near the surface, 12 miles from Trevandrum.

Graphite, 20 miles north-east of Trevandrum.

Graphite. Trevandrum.

Graphite.

Graphite. Almorah. Kumaon. Found in nodules near the surface.

Graphite. Ceylon.

Sulphur.

This element is found in small quantities in the Puga Valley, N.W. Himalayas, in Kumaon, Gurhwal, the Punjab, S.E. Afghanistan, Beluchistan, and Burmah.

Sulphur. Rangoon.

Sulphur mines near Shoruns. Beluchistan.

Corundum.

This mineral is found in abundance in Salem, Mysore, and other localities in the Madras Presidency; it also occurs in the Punjab and at Rewah in Bundelkund, where it is associated with jade. The precious forms of alumina, viz., Oriental rubies, sapphires, amethysts, &c., are not found in India itself, but in Ceylon, Independent Burmah, and the countries north-west of the Himalayas.

Corundum. Madras.

Corundum. Madras.

Corundum. Salem. In hexagonal prisms.

Corundum. Salem.

Corundum. Salem.

Corundum. Mysore.

Minerals used for Ornament.

Ruttunpoor agates, unburnt.

Ruttunpoor agates, burnt.

Sone river pebbles.

Rough carnelians. Cambay.

The carnelians and agates from Cambay, which have been known since the time of the Romans, are derived from immense beds in the débris of the trap rock in the Rajpiplee Hills near Ruttunpoor, 13 miles east of Broach. They are cut and polished by the lapidaries of Cambay and Jubbulpore.

Gem sand. Ceylon. Containing zircons, spinels, tourmalines, sapphires, &c.

Ruby sand. Travancore.

Rough garnets. Ruby River, Mysore.

Rough garnets. Vizianagram.

Garnets (carbuncles) cut *en cabochon* and polished.

Calderite. A massive iron-lime garnet found in Nepal and near Hazaribagh.

Schorl (tourmaline) in quartz. Nellore. Madras.

Tourmaline. Nellore. Madras.

Epidote granite. Carangooly, Chinglepat. Madras.

Epidote granite. Bodinatham, N. Arcot. Madras.

This handsome rock is found in a few other localities, as in South Mirzapur, Bancoorah, and Rupshu in the N.W. Himalayas.

Limestones, &c.

Kunkur. South Arcot. Used as a flux at Trinamalee.

Kunkur. Nellore. Madras.

Limestone. Tripattur. Salem.

Calc spar. Masulipatam. Madras.

Kunkur. Beronda. Bundelkund.

Kunkur is a nodular fresh-water limestone, occurring in most parts of India. It is usually concreted round a fragment of wood, shell, &c. It contains on an average about 72 per cent. of calcium carbonate, 15 of silica, and 11 per cent. of clay; the deposits sometimes attain a thickness of 60 or 70 feet.

Calcite. From the coal fields near Ranigunj. Used as a flux and in the manufacture of cement. It occurs in boulders 200, 300, or more cubic feet in capacity.

**Calc spar.** This is found in Kabul, and is used by the inhabitants of the Punjab medicinally under the name of "Surma safaid,"—white antimony. It is used for the same purposes as sulphide of antimony.

**Fibrous gypsum** and other varieties of sulphate of calcium. Karnul.

**Selenite.** Crystallised sulphate of calcium.

**Steatite or soapstone.** Ava.

This mineral is common; the most valuable varieties are found in Karnul, Salem, Mysore, near Chittoor, and at the Naggerly Hills.

**White mica.** Salem.

**Black mica.**

Mica is found abundantly in Behar, and the Northern Circars.

**Agalmatolite or figure stone.** Found near Chota Nagpur.

**Fullers earth.** Sind.

**Zeolites.** Heulandite, and stilbite, on trap rock. Deccan.

**Zeolites** with apophyllite on trap rock. Deccan.

**Amygdaloid rock,** containing zeolites, &c. Green earth. Deccan.

These hydrated double silicates, together with calc spar and quartz, are very abundant in the vesicles of the trap of the Deccan.

**Reh.** Buttiana.

A saline efflorescence occurring on soils, and rendering them unfertile. It is especially noticed in the lands irrigated by the Ganges and Jumna Canal, and in parts of the Punjab. It consists mainly of sodium sulphate and sodium chloride; when dry containing from 76–96 per cent. of the former to 24–4 per cent. of the latter. Kunkur is usually found underlying the reh. It is valuable in the alum manufactures. Some varieties contain considerable quantities of sodium carbonate and are then used for making soap and a rough kind of glass.

#### COAL AND COMBUSTIBLE MINERALS. Class 101.

The coal fields of India lie in a region bounded on the north by the Ganges, and extending beyond the Godavari on the south, from east to west, they stretch from the neighbourhood of Calcutta to some distance down the Nerbudda. Outside these limits there are coal fields in Upper Assam, the Khasia Hills, and Burmah. The total area over which coal rocks may be presumed to extend is 35,000 square miles, making India fifth in the coal-bearing areas of the world; the United States, China, Australia, and Russia only being before it. Nearly all the coal comes from one geological formation called "Damuda," from the river in whose valley some of the principal coal seams occur. Some of the seams, including partings, are of gigantic size in the Hengir and Damuda fields, reaching 100, 120, and even 160 feet in thickness. The coal that has hitherto been worked is characterised by its excessive lamination and great quantity of ash, this being rarely under 10, and reaching to 30 per cent.; the per-centage of fixed carbon is rarely 60 per cent., and averages about 52 per cent. The coal of Assam and of the Khasia Hills is of better quality.

**Coal.** Gurrawarra. Central Provinces. Nerbudda Coal and Iron Company's pits.

**Coal.** Oormoo. Alubera. Near the Bansloi stream in the centre of the Rajmahal Hills. Seams 7 feet and 3 feet.

Contains—Fixed carbon	-	45·0
Volatile matter	-	44·6
Ash	-	10·4

**Coal.** Chigo. Alubera Collieries. 5-foot seam.

**Coal.** Malacca.

**Lignite.** Darjiling. Small irregular masses and strings of lignite are met with in the sandstone.

**Petroleum and naphtha.** Burmah.

Petroleum is found in abundance in Burmah, especially in the neighbourhood of Rangoon. There are also wells in the islands of Ramree and Cheduba. The specific gravity of the petroleum varies from ·815 to ·909. Petroleum is also found in Assam, having a specific gravity of ·971.

CLAYS AND OTHER MATERIALS USED IN POTTERY, AND EARTHY MINERALS. Class 104.

Clays for pottery. South Arcot. Madras.  
 Clay for pottery. Madura.  
 Powdered mica. (*Abrak*.) Lahore. Ready for mixing with lime for ornamental plaster, &c.  
 Clay for pottery. North Arcot. Madras.  
 Clay for pottery. Sadigeri. N. Arcot.  
 Clay for pottery. Bangalore. From decaying granite.  
 Clay for pottery. Vizianagram. From decaying albite.  
 Quartz, used in the manufacture of glass, &c.  
 Yellow ochre. Madras.  
 Red ochre. Madras.  
 Fire clay. Madras.  
 China clay. Madras.  
 Ball clay. Mangalore. South Canara.  
 Porcelain clay. Canara. Bombay.  
 Ball clay. Raepore. Central Provinces.  
 Raw clay. Pattan. Gujerat.  
 Clay, prepared. Pattan. Gujerat.  
 Fine white clay. Pattan. Gujerat.  
 Powdered marble. Pattan. Gujerat.  
 Red ochre. Pattan. Gujerat.  
 Red lead. Pattan. Gujerat.  
 Litharge. Calcutta.  
 White lead. Punjab.  
 White earth. Beronda. Bundelkund.  
 "Geroo." Fine red ochre. Raepore.  
 Pink earth. Paldeo. Bundelkund.  
 Yellow earth. Paldeo. Bundelkund.  
 White earth. Punnah. Bundelkund.  
 Yellow earth. Alipore. 24 Pergunnahs.  
 Pipe clay. Singapore.  
 Red clay. Duttiah. Bundelkund.  
 White earth. Kotee. Bundelkund.  
 Decaying granite.

*Limes.*

Lime. Bownee. Bundelkund.  
 Lime from the limestone of the Shevaroy Hills. Salem.  
 Lime. Bellary.  
 Lime. Soonporah. Sudujah. Upper Assam.

DEPARTMENT II.—MANUFACTURES.

CHEMICAL. Class 200.

*Salt.*

The salt deposits of the Salt Range, hills running through the Jhilam and Shahpur districts, and on to Kalabagh, are equalled by none in the world for extent and purity. Salt is excavated at four places—at the Mayo mines, Kheora, and Sardi mines in the Jhilam district, at Warcha mine in Shapur, and at Kalabagh, where the salt is quarried from the surface. In the Trans-Indus district of Kohat, salt is obtained from a chain of hills running from the Indus towards Bohadur Kheyl; that found near the surface is of a black or dark green colour, but the greater portion is remarkably pure.

The consumption of salt in Bengal amounts to nearly 10 lbs. per head per annum, in the Madras Presidency to about 12 lbs., and in the Bombay Presidency to 9½ lbs. per head per annum. Until 1863 the districts on the sea-board of the Bay of Bengal were divided into salt agencies, and two kinds of salt were produced,—*Pungah* salt, obtained by boiling highly concentrated brine to dryness, and *Kurkutch* salt, produced from sea water by solar evapora-

tion alone. In 1863 the government manufacture was abolished, and a system of excise, with duty on imported salt, was instituted. There is a manufacture under excise on the shores of the Chilka lake in the Puri district of Orissa. In the N.W. Provinces the salt supply is mainly derived from Sambhur and other salt lakes in Rajpootana. In the Bombay Presidency there are salt works on the shores of Gujerat and at Kheraghora, and large quantities are made by solar evaporation in the Runn of Kutch.

Rock salt. Salt Range. N.W. Himalayas.

Rock salt. Salt Range. N.W. Himalayas.

Salt. Poorthemauk. Madras.

Salt.

Salt. Nellore.

Salt, refined. Nellore.

Common salt. Toomlook. Midnapore. Bengal.

Common salt. Pungah salt. Cuttack.

Common salt. Pungah salt. Balasore. Cuttack.

Common salt. Cuttack.

Common salt. Hidgelee. Bengal.

Common salt. Hidgelee. Bengal.

Common salt. Ghat Kissennuggur. Hidgelee.

Common salt. Cuttack.

Common salt. Jeypore. Rajpootana.

Common salt in crystals. Patree. Ahmedabad.

Common salt, whole. Patna. Bengal.

Common salt, ground. Patna. Bengal.

Common salt, used for salting hides.

Common salt. Sambhur. Rajpootana.

Black salt. Calcutta. Used medicinally in a great number of cases. It contains sulphide of sodium, and is manufactured by heating certain fruits, &c. with common salt and *sajji* or crude carbonate of sodium containing much sulphate.

#### *Saltpetre.*

This salt (nitrate of potassium), called *Shorah*, occurs in many parts of India as an incrustation on the soil, and mixed with it to some depth, though not lower than the air can penetrate. The soils producing it must be rich in alkaline, or alkaline earthy bases, to fix the nitric acid, formed by the oxidation of organic (especially animal) matter, as soon as formed. It also effloresces on old mud walls, cow-house walls, and about ruins and old villages. Nearly the whole of the exports of saltpetre are from Bengal. To prepare the saltpetre the nitrated earth is boiled with water, filtered, concentrated by the heat of the sun, and afterwards evaporated with artificial heat. In some parts of the Punjab the earth is packed in coarse vessels with a small aperture at the bottom, a layer of straw is placed at the bottom to act as a filter, then a layer of wood ashes, and finally the nitrated earth, water is then percolated through, and the extract evaporated. This treatment with wood ashes, which converts other nitrates, especially nitrate of calcium, into the potassium salt, is not carried out in Bengal, where the soil already contains much potash. Saltpetre is prepared in many places for local uses only, e.g., the manufacture of gunpowder, fireworks, and frigorific mixtures.

Saltpetre or nitre. Cutch.

Saltpetre or nitre. Sarun. Bengal.

Saltpetre or nitre. Bengal.

Saltpetre or nitre. Ahmednuggur. Bombay.

Saltpetre or nitre. Lahore. Punjab.

Saltpetre or nitre. Central India.

Saltpetre or nitre. Ellore. Masulipatam.

Saltpetre or nitre, 1st sort. Nellore.

Saltpetre or nitre, 2nd sort. Nellore.

Saltpetre or nitre, refined. Cawnpore. N.W. Provinces.

Saltpetre or nitre. Salem. Madras.

Saltpetre or nitre. Bengal.

Saltpetre or nitre. Madras.

Saltpetre or nitre, purified at Calcutta.

*Alum.*

This salt is manufactured to a large extent at Mhurr in Cutch; the works are said to have been carried on for the last four or five centuries. The material used is a dark pyritous shale, which is exposed for four months in heaps, and sprinkled with water. The efflorescence, called "seed of alum," is boiled with nitre, or with an alkaline salt made by burning the village refuse, treating the ash with water, filtering and boiling down. Alum is also made from a black shale at Kalabagh on the Indus, and at Kutki in the Chicalli Range beyond the Indus. A native sulphate of aluminium, arising from the oxidation of pyrites in aluminous shales, occurs in the mountains of Kumaon and in Nepal. It is called *Salajit*, and wonderful medicinal virtues are attributed to it; in the plains it often sells for its weight in silver.

Alum. Madras bazaar.

Alum. Lahore bazaar. Punjab.

Alum. Bengal.

*Carbonate of Soda.*

Impure carbonate of soda, Dhobies' earth or *sojji mutti*, occurs as an efflorescence in almost every district in India. It is used in the manufacture of native soap and glass.

Crude carbonate of soda. Sind.

Crude carbonate of soda. Calcutta.

Anhydrous sulphate of iron. Salt Range. Occurs in large masses in the ground.

*Borax.*

Borax, *sohaga* or tincal, is obtained in considerable quantities in Puga Valley, Ladakh, and from lakes in Thibet. It is collected on the edges of the lakes, and transported across the Himalayas on sheep and goats, and refined at Umritzur and Lahore.

Borax in native crystals. Thibet.

Borax. Thibet.

*Sal Ammoniac.*

Sal ammoniac. "*Naushadar*." Kurnal. Punjab.

Sal ammoniac (chloride of ammonium) has been manufactured for ages by the potters of the Kaithal and Gula tahsils of the Kurnal district. To obtain it, from 15,000 to 20,000 bricks of a dirty clay or mire found at the bottom of ponds are placed round the outside of each brick kiln; when about half burnt the raw substance from which *Naushadar* is made exudes, and adheres to the exterior of the bricks. This is purified by solution, crystallisation, and subsequent sublimation in large closed vessels of thin black coloured glass.

In Oude it is manufactured from the contents of cesspools.

Sal ammoniac. Calcutta.

Sulphate of copper. Blue vitriol. Calcutta.

Used medicinally, and in making astringent tooth-powders.

## PAINTS AND DYES. Class 202.

Gamboge (*Garcinia morella*). Bombay.

Indigo, four samples (*Indigofera tinctoria*).

S. Arcot, Moorshedabad, Madras, Shikarpore.

The history of the commerce of this substance would be eminently interesting, but it is not possible to enter on the subject here; suffice it to say, that on its first introduction into Europe it was almost driven out by the bitter intolerance of persons whose object was to prevent the old-fashioned *woad* (then in use as much as indigo is now) from being driven out before it. In 1557, at Frankfort, it was denounced by the Germanic diet as the "devil's dye," and its use forbidden. The prohibition was repeated in 1603; and as late as 1654, by imperial edict at Ratisbon, the proscription was enforced. In England an Act was made in Elizabeth's time, authorising the seizure and destruction of the offensive substance, as well as the detention of persons

possessing it. The Act continued in force till the reign of Charles II., and "Brasil wood" shared the odium with it.

Indigo is known to chemists under two forms—white indigo (indigogene) and blue indigo, the latter being only an oxidised state of the former. The blue colour is entirely due to the oxygen, or at least comes to the substance as it gets access to the oxygen of the air; this is observable in the vats. When the fermented liquor or infusion of the plant first ferments with the appearance of whitish grey bubbles, afterwards these become blue, and finally a deep metallic lustrous purple red. Dyed cotton, when just taken out of the dyeing vat, appears green, but rapidly assumes its deep blue tone from contact with the air. Blue indigo is perfectly insoluble in water, but it is found that it is so only so long as it retains its excess atom of oxygen. If it can be induced to part with that, the remaining indigogene is soluble in an excess of sulphate of lime, or rather alkali. Hence, for cotton dyeing, the vat is prepared by grinding up a quantity of indigo with water to the consistency of cream, and then mixing it with copperas and an excess of lime or alkaline water. The oxygen of the indigo then combines with the protoxide of iron in copperas to form oxide, and then the deoxidised indigo readily combines with the lime water, forming a yellowish green liquid, into which the fabric to be dyed is plunged; and then, on being taken out and exposed to the air, the oxygen returns to the solution with which the fabric has been saturated, and the deep blue is restored and becomes permanent without the use of any mordants. The dye applied in this manner is used cold. According to the plan adopted by native dyers, "chunám," "sajji" (crude potash), and "gurb" (molasses) form the solvent and deoxidising agents; otherwise the process is identical. They do not use copperas, though they have it in plenty in the form of "lúra kasis," or "kalú safed." Wool and silk are not dyed in this way, but in another manner, taking advantage of another property of indigo. Pure indigo is soluble in sulphuric acid, but the solution is thick and black. This has been called *cæruleo sulphuric acid*, *sulphindyllic acid*, &c. ("murabba" in Urdú), because it has the nature of both the indigo and the acid, neither undergoing the slightest change in itself. This latter substance is not a sulphate of indigo; that would imply a chemical combination between the acid and the dye, and the formation of a new substance, but it is not so. The acid and indigo combine, but neither is changed. This solution is capable, however, of destruction by an excess of caustic alkali, and turns by it to a yellow colour, from which nothing will restore it.

This sulphindyllic acid is principally employed in dyeing wool and silk, and the excess acid is removed by washing in alkali.

Chemically pure indigo is of specific gravity 1.50, and possesses neither taste nor smell; it is a substance "indifferent," having neither acid nor basic properties. Good indigo is known by its fine purple blue colour, and by its fracture, which when rubbed with a hard smooth substance exhibits a coppery red lustre. No remarks need here be added on the manufacture of indigo. The ordinary processes of fermentation, of drawing off the liquor, of beating, and of collecting the "fecula," or precipitate of indigo, from the liquor and pressing it, are universally well known, and are followed with but trifling variations in different provinces and different manufactories.

The main points appear to be, the watching the soaking plants so as to be able to tap off the infused liquor exactly at the right point of fermentation, and next, to beat the liquor in the second vat exactly long enough. No doubt in these points the native manufacturers in this province are as yet eminently deficient. Knowledge of these things can only be acquired by careful observation and long experience. Another point is, that the "fecula" is much improved, after being collected, by being boiled in copperas, and then pressed into its boxes.

Indigo manufactured by simply collecting the fecula, and dropping it down in cakes to harden in the sun, is termed "*gaud indigo*."—(Baden Powell's "*Punjab Products*.")

Cutch, 4 samples (*Acacia catechu*). Calcutta, Madras, Burmah.

Gambier, 2 samples (*Nauclea gambir*). Bombay, Malacca.

Lac dye (in cakes). Jubbulpore.

Lac dye (in cakes). Malwa.

## ENAMELLED TILES. Class 208.

Ornamental tiles (2 pieces). Hyderabad.  
Ornamental tiles (4 pieces). Hyderabad.

## EARTHENWARE. Class 210.

Water jug. Patna.  
Water jug. Patna.  
Water vessel, painted. Jhallawar.  
Box. Allahabad.  
Hookah bowl (chillum). Patna.  
Hookah bottom. Patna.  
Water vessel. Madras.  
Water vessel, unglazed. Jhallawar.  
Water vessel, glazed. Jhallawar.  
Water vessel. Patna.  
Vase. Sindh.  
Water vessel. South Canara.  
Glazed green cup. Hyderabad. Sindh.  
Dish and cover. Hyderabad. Sindh.  
Glazed vase. Hyderabad. Sindh.  
Water vessel. Madras.  
Water vessel. Madras.  
Water vessel. Allahabad.  
Glazed bowl and cover. Hyderabad. Sindh.  
Goblet. Vizagapatam.  
Pitcher. Madras.  
Pitcher. Bombay.  
Jug. Madras.  
Milk pan. Madras.  
Soapstone cup. Allahabad.

## POTTERY.

*Process of making and glazing earthenware in Sind.*—The clay required for this purpose is obtained 10 feet under ground, in situations which have been inundated. It is reduced to a fine powder and soaked in water for 24 hours, after which it is kneaded with the hands and feet until it becomes dough-like. Lumps proportionate to the articles to be made are then mounted on a wheel and formed into the required shape. After the vessels have dried, they are again put on the wheel, and finished by means of an iron tool. Tiles are prepared in moulds, and when dried are rubbed over with a piece of wet cloth and beaten with an earthen "maul" for the purpose of smoothing the surface; they are then kept for two or three days or more till they become sufficiently firm, and after having been cut to the proper size, are piled on layers in the sun to dry.

The vessels, tiles, &c. having been sun-dried, may then be sent to the kiln, after which the required pattern is traced on them in the following manner. A perforated paper pattern is placed upon the article, and powdered charcoal sprinkled over it. On removing the paper, the pattern remains on the earthenware, and is then brushed over with a solution called "Sahree," the description of which is given below.

When this is dry, glaze of the required colour is prepared and poured over it; the article is then allowed to dry again, after which it is placed in the glazing kiln, and subjected to the required amount of heat. The articles are only removed after the kiln has become cold.

## Preparation of "Sahree."

"Sahree" is clay found only in the vicinity of Sehwan, and vended at Hyderabad (Sind) at a rupee per maund (82 lbs.) When required for use it is put into a large vessel over night, with water enough to cover it. In the morning it is found to have attained the consistence of paste, and this being strained, it is ready for use.

## Preparation of "Moordarsing" (Litharge).

For *green* colouring two pounds of "Sendoor" (red lead), one pound of "Waree" (sand), and a quarter of a pound of carbonate of copper are mixed together and put into an unbaked vessel previously plastered over on the inside with a mixture of "Waree" (sand) and "Sahree" (clay). This vessel is then placed in a heated oven, when the articles are melted together and form a hard substance, used for colouring green. When required for use it is ground to powder in a hand-mill, sifted, and mixed with wheat paste.

For *red* or *yellow* colouring, the process is the same as above described, substituting red "Dha" or earth for the carbonate of copper.

For *purple* colouring, instead of a solution of "Sahree" the baked tile or vessel is washed over with black "Dha" (earth), and the "Moordarsing" for red or yellow colouring is used as a glaze.

For *blue* colouring or glazing, lime obtained from flint is freely powdered, sifted, and mixed with wheat paste. This mixture is poured over the unbaked article and allowed to dry. "Lajwurde," a blue colour, is then ground on a stone with water, to the consistence of paste, and brushed over the prepared article. When dry "Kashee" or white glazing matter is put on and the vessel placed in the kilns as before.

If the "Lajwurde" (Lapis Lazuli) used in the last process be omitted, the result will be simply a white glaze.

## "Cashee-jo-rung" or glazing composition.

This is made of four parts of "Chaneo" (alkaline earth) and one part of "Jubbul-jee-waree" (hill sand). These are mixed together and placed in the kiln to melt. The substance thus obtained by fusion becomes the glazing material, when it is added to paste and used as other pigments.

## METAL UTENSILS. Class 224.

- Brass box to hold areca nuts. Calcutta.
- Copper lamp. Calcutta.
- Brass cup. Benares.
- Brass cup. Bengal.
- Copper water vessel. Bengal.
- Copper and brass cup. Bombay.
- Sweetmeat plate. Calcutta.
- Betel plate inlaid with silver. Hyderabad.
- Cup made of mixed tin and brass. Odyppore.
- Spice box. Patna.
- Rose water sprinkler made of mixed tin and brass. Odyppore.
- Brass cup. Indore.
- Brass dish for sweetmeats. Calcutta.
- Copper bell. Burma.
- Lock and key. Indore.
- Lock and key. Indore.
- Lock and key. Indore.
- Brass bowl (Jumbir). Mirzapore.
- Copper bowl. Madras.
- Brass cup. Travancore.
- Brass basin. Travancore.
- Brass basin with figured sides. Nepal.
- Spitting dish. Cachar.
- 2 hanging lamps. Madras.
- 2 stand lamps. Madras.
- 1 upright lamp. Madras.
- 1 swing lamp. Madras.
- Sacred brass vessel with figures. Nepal.
- Copper amulet case. Thibet.
- Brass spoon for oil. Madras.
- Turner brass bowl and cover. Poonah.

**MATTING. Class 229.**

Phulgat mat. Travancore.

**COTTON FABRICS, PLAIN. Class 230.**

Muslin (Jamdane). Dacca.  
 Muslin, plain. Dacca.  
 Muslin (Nyvo Soak). Dacca.  
 Muslin (Arnee). Madras.  
 Cotton pieces (two). Madras.

**COTTON FABRICS, DYED. Class 231.**

Striped cotton piece (two samples). Madras.  
 Trousers piece, check. Madras.

**CARPETS. Class 239.**

Carpets imported by Messrs. Vincent Robinson & Co., Welbeck Street, London, viz. :—

Cashmere carpet made of the fine wool used in the manufacture of the shawls of the country.  
 Woollen carpet. Madras.  
 Woollen carpet. Scind.  
 Woollen carpet. Madras.  
 Woollen carpet. Ferahan, Persia  
 Woollen carpet. Ferahan, Persia.

**FABRICS OF GOATS' WOOL, &c. Class 240.**

Cashmere shawls, chuddahs, &c. Imported by Messrs. Farmer & Rogers, Regent Street, London, viz. :—

Long gold shawl.  
 Long Cashmere shawl.  
 Long green shawl.  
 Long black shawl.  
 Square black shawl.  
 Square black shawl.  
 Square black shawl.  
 Square black shawl.  
 Square black shawl, narrow border.  
 Square black shawl, narrow border.  
 Square scarlet shawl, narrow border.  
 Square scarlet shawl, narrow border.  
 Long white Umritsur shawl, narrow border.  
 Square grey Umritsur shawl, narrow border.  
 Square black and white Umritsur shawl, narrow border.  
 Square drab Umritsur shawl, narrow border.  
 Square white net shawl.  
 Square black and white net shawl.  
 Long white chuddah.  
 Long white chuddah.  
 Long white chuddah.  
 Long white chuddah.  
 Blue chuddah.  
 Blue chuddah.  
 Drab chuddah.  
 Drab chuddah.  
 Drab chuddah.  
 Drab chuddah.  
 Drab chuddah.  
 Drab chuddah.  
 Drab chuddah.  
 Scarlet chuddah.  
 Scarlet chuddah.

White chuddah.  
 White chuddah.  
 Cravat.  
 Cravat.  
 Cravat.  
 Cravat.  
 Cravat.  
 Fine India scarf.  
 Fine India scarf.  
 Fine India scarf.  
 Fine India scarf.  
 Fine India scarf.  
 Fine India scarf.  
 Black India scarf.  
 Drab embroidered burnouse.  
 Drab embroidered burnouse.  
 Black India cloak.  
 Rich black and gold table cover.  
 Rich black embroidered gold cloak.  
 Rich black gold stripe burnouse

#### RAW SILK AND COCOONS. Class 242.

Raw silk (yellow). Surdah, Bengal.  
 Raw silk (cocoons, yellow). Bengal.  
 Raw silk (white). Berhampore, Bengal.  
 Raw silk (yellow). Bogra, Bengal.  
 Raw silk (yellow). Seetapore, Oudh.  
 Raw silk (tape chussum). Bengal.

At the present time the production of mulberry-worm silk is principally confined to the Lower Provinces of Bengal and to the districts of Rajshahye, Maldah, Moorshedabad, Midnapore, Beerbhoom, Hooghly, Burdwan, Bogra, Howrah, Nuddea, Jessore, and the 24 Pergunnahs. The five first are the great silk-producing districts. In the district of Rajshahye there are 34 filatures owned by Europeans, and 63 owned by natives, or 97 in all, containing 5,760 basins, and employing between 11,000 and 12,000 hands. The yield of raw silk is estimated about 400,000 lbs., and it is believed that no less an area than 150 square miles is under mulberry cultivation, while a quarter of a million of people derive their support from the trade in one or other of its branches in this one district alone.

Tusseh silk thread. Bengal.  
 Tusseh silk thread. Gyah.  
 Tusseh silk thread. Bhagulpore.  
 Tusseh silk thread. Bengal.  
 Tusseh silk thread (dyed). Bengal.  
 Tusseh silk (cocoons). Cuttack.

The Tusseh silkworm is the most important and widely distributed of the wild silk-producers of India, being found in the Sub-Himalayan tracts almost throughout the extent of the range, through the hills from Assam to Chittagong, in the Soonderbuns, everywhere in the great belt of hill and forest inhabited by the Sonthal, the Kol, the Khond, and the Gond, in the Western Ghâts, and in portions of the Madras and Bombay Presidencies. The worm is multivoltine, but it is not clear how many times in the year it goes through its transformations, or whether its periods of existence may not vary according to conditions of climate. It feeds variously on the Ber (*Zizyphus jujuba*), country almond (*Terminalia catappa*), Asun (*Term. alata*), Saj (*Term. tomentosa*), Seemul (*Bombax heptaphyllum*), Sal (*Shorea robusta*), and other trees. In some parts no attention whatever is paid to the rearing of the worms, the cocoons being simply collected by certain classes of the people from the trees in the forests on which they occur. They are afterwards sorted according to size, thickness, colour, &c., and carted off to the dealers. In other parts a batch of the wild cocoons are selected, the moths allowed to emerge, and the sexes paired; the eggs thus procured are hatched, and the young worms

then placed upon the trees; in this partial state of domestication, the rearers tend the insects through all their stages, but depend entirely on the wild cocoons for each year's stock.

The method of reeling is primitive in the extreme, and to its imperfections is attributed the scant attention this valuable and very beautiful silk has hitherto received.

Eria silk thread. Rungpore.

Eria silk thread (of sorts). Rungpore.

Eria silk thread. Assam.

Eria silk (cocoons). Assam.

The Eria or Arindy silkworm is reared in Assam, and a tract to the south-west of that province, comprising the districts of Dinagepore, Rungpore, and part of Bhagulpore and Purneah. The worms are fed in the houses principally upon the leaves of the castor-oil plant (*Ricinus communis*), and yield seven or more broods in the year. It is reared chiefly by low-caste Hindoos, Mekirs, and Cacharees. The cocoons are mostly of a light rust colour; some, however, are also white. The silk is carded, not reeled, in consequence of the resinous nature of the binding matrix of the cocoon. Most of the silk is used for home consumption.

#### RAW SILK, DYED. Class 243.

Floss silk, dyed (various colours). Umritsur.

Floss silk, dyed (various colours). Punjab.

Floss silk, dyed (various colours). Vellore, Madras.

Floss silk, dyed (various colours). Tatta.

Floss silk, dyed (various colours). Cashmere.

#### SILK FABRICS, PLAIN. Class 245.

Tusseh silk piece, plain. Beerbhoom.

Mushroo piece (satin and cotton back). Hyderabad, Deccan.

Silk cloth, coarse. Bogra.

#### SILK FABRICS, FIGURED. Class 246.

Silk piece, gold and crimson striped. Ahmedabad.

Silk piece. Burmah.

Kincob piece. Benares.

Tusseh silk piece, striped. Bhagulpore, Bengal.

#### GARMENTS. Class 250.

Woman's garment (Saree). Madras.

Woman's garment (Saree). Dharwar.

Cashmere coat (Choga). Lucknow.

Scarf (Kummerbund). Coorg.

Scarf (red net). Delhi.

Scarf (green muslin). Delhi.

Child's dress (Jubla). Surat.

Satin apron. Sind.

Woman's silk garment. Sattara.

Man's garment (scarf). Goodaspore. Punjab.

Man's garment (Loongee). Moultan.

Man's garment (Loongee). Sind.

Woman's garment. (Thaming.) Pegu.

Pinna silk dress skirt. Madras.

#### SHOES, &c. Class 251.

Pair of shoes, embroidered. Hyderabad, Sind.

Pair of shoes, embroidered. Gwalior.

Pair of shoes, velvet, embroidered with gold. Sind.

Pair of shoes, velvet, embroidered with gold. Kotah.

Turban, crimson and gold. Madura.

Turban, white with gold border. Madura.

## EMBROIDERED FABRICS AND LACE. Class 252.

Net embroidered with gold and beetle wings. Hyderabad.  
 Net embroidered with gold and beetle wings. Deccan.  
 Gold-embroidered cloth. Madras.  
 White net embroidered with gold. Triplicane, Madras.  
 Muslin dress skirt, embroidered. Dacca.  
 Muslin embroidered with gold and beetle wings. Madras.  
 Two small circular pieces, embroidered. Sind.  
 Slipper fronts (pair). Sind.  
 Silk scarf embroidered with narrow gold ribbon. Delhi.  
 Velvet bodice embroidered. Benares.  
 Linen coat, embroidered with gold and colours. Bhurtpore.  
 Silver band strips embroidered with beetle wings. Madras.  
 Cotton piece embroidered with Moonga silk. Dacca.  
 Embroidered chess cloth. Burhampore. C. India.  
 Circular piece satin, embroidered. Madras.  
 Bag piece embroidered with gold and beetle wings. Bombay.  
 Book cover, embroidered, crimson velvet and gold. Sind.  
 Slipper fronts, three pair. Sind and Loodiana.  
 Silk gauze piece, embroidered. Trichinopoly.  
 Kincob scarf. Ahmedabad.  
 Doll figures, dressed. Benares.

## LACE.

Sooneri, gold, ootani kinaree. Bombay, Surat, and Ahmedabad.  
 Leharee, gold kinaree. Bombay, Surat, and Ahmedabad.  
 Leharee, gold kinaree, small red. Bombay, Surat, and Ahmedabad.  
 Leharee, gold kinaree, small green. Bombay, Surat, and Ahmedabad.  
 Ootani, purple kinaree. Bombay, Surat, and Ahmedabad.  
 Ootani, green kinaree. Bombay, Surat, and Ahmedabad.  
 Yekputtee hurree, green kore. Bombay, Surat, and Ahmedabad.  
 Yekputtee jamlee, purple kore. Bombay, Surat, and Ahmedabad.  
 Yekputtee asmanee, blue kore. Bombay, Surat, and Ahmedabad.  
 Bé puttee jamlee, purple kore. Bombay, Surat, and Ahmedabad.  
 Bé puttee soneree, gold kore. Bombay, Surat, and Ahmedabad.  
 Yekputtee rooperi, silver kore. Bombay, Surat, and Ahmedabad.  
 Yek sapolianee, silver kore. Bombay, Surat, and Ahmedabad.  
 Tunputtee rooperi, silver kore. Bombay, Surat, and Ahmedabad.  
 Sapolia sadi hurree, green kore. Bombay, Surat, and Ahmedabad.  
 Tun putteenee, green kore. Bombay, Surat, and Ahmedabad.  
 Bé putteenee, green kore. Bombay, Surat, and Ahmedabad.  
 Bé sapolianee gungajumnee, green kore. Bombay, Surat, and Ahmedabad.  
 Leharee sapolianee gungajumnee, green kore. Bombay, Surat, and Ahmedabad.  
 Otanee gungajumnee, gold and silver kore. Bombay, Surat, and Ahmedabad.  
 Yek, sapolianee, gold and silver kore. Bombay, Surat, and Ahmedabad.  
 Bé kungra, gold and silver kore. Bombay, Surat, and Ahmedabad.  
 Leharee soneree, gold and silver kore. Bombay, Surat, and Ahmedabad.  
 Leharee soneree, gold and silver kore. Bombay, Surat, and Ahmedabad.  
 Plain puttee, gold kore. Bombay, Surat, and Ahmedabad.  
 Yek-tara puttee, gold kore. Bombay, Surat, and Ahmedabad.  
 Gokroo soneree, gold kore. Bombay, Surat, and Ahmedabad.  
 Gokroo rooperie, silver kore. Bombay, Surat, and Ahmedabad.  
 Silver lace, 3 tolas. Nagpore.  
 Silver lace, 1 yard. Nagpore.  
 Lacha silver lace, 1 yard. Nagpore.  
 Silver lace. Nagpore.  
 Lace,  $3\frac{1}{2}$  tolas. Nagpore.  
 Lace, 1 yard. Nagpore.  
 Lace, 1 yard. Nagpore.  
 Lace, 3 yards. Nagpore.

Collar. Madras.

Collar. Madras.

Handkerchief border. Madras.

Six specimens of white lace (1 yard long each). Madras.

Cravat.

Sixteen specimens of white cotton lace. Bombay.

Handkerchief. Poona Convent.

Pair of doyleys. Madras.

Specimens of lace. Madras.

Specimens of lace. Madras.

The manufacture of lace in India is entirely of European origin, and the workers are mostly under European guidance.

Fifteen frames containing photo-lithographs, by W. Griggs, illustrative of the textile manufactures of India.

These photographs form portions of the following work illustrating and exhibiting the **CHIEF TEXTILE MANUFACTURES OF INDIA**, now in course of preparation at the India Museum, under the direction of the Reporter on the Products of India, to the Secretary of State for India in Council.

This work comprises—

Thirteen quarto volumes, containing 720 examples, in the actual material, of the following textile fabrics, viz.,—

1 volume of kincobs or gold brocades	- 58 samples.
1 volume of mushrooms	- 67 samples.
2 volumes of silks	- 106 samples.
1 volume of cotton and silk mixtures	- 60 samples.
2 volumes of cotton trousseings	- 121 samples.
1 volume of bodice (or cholee) pieces	- 51 samples.
1 volume of muslins and calicoes	- 57 samples.
1 volume of cotton prints	- 80 samples.
3 volumes of woollens	- 120 samples.

Total - - 720

Eight large folio volumes, containing 240 lithographic and chromo-lithographic plates, exhibiting the patterns of 400 of the richly-decorated scarfs so largely worn by both sexes in India, together with examples of the embroidery applied to the ornamentation of garments, &c. This section will likewise contain a considerable number of samples showing the actual material of which many of the illustrated fabrics consist.

Thirty glazed frames, with mounts exhibiting the 240 plates last mentioned, suspended around a central pillar, an arrangement which both economizes space, and facilitates the examination of the different subjects.

The diameter of the circle or floor space occupied by the pillar and its projecting frames is about six feet.

The various samples and illustrations of which the work consists are accompanied by details as to the length, width, cost, and place of production of the fabrics from which the specimens were originally cut, or from which the illustrations were taken by photo-lithography. The work, therefore, affords a large amount of practical information, whilst it presents in a convenient form what may be regarded as a very complete *Grammar* of Indian Ornamentation in so far as textiles are concerned.

The price of the work complete is 150*l.*, a sum which simply covers the cost of its production; and it has already been subscribed for by all the chief centres of commerce in Great Britain, and by several institutions abroad. Fourteen out of the total number of volumes of which the work will consist have been completed, and it is expected that the whole will be finished in the course of the present year.

**JEWELLERY. Class 253.**

A collection of Jewellery. Exhibited by Messrs. Watson & Co., Bombay.

**FANS. Class 254.**

Talc fan, embroidered. Madras.  
 Palm-leaf fan, with lace edgings. Madras.  
 Two khus khus fans, made from the fragrant roots of the khus khus grass  
 (*Andropogon muricatum*). Madras.  
 Straw fan. Monghyr.  
 Palm-leaf fan. Madras.  
 Palm-leaf fan. Madras.  
 Silver-handled fan, embroidered with gold, &c. Delhi.  
 Fan made of strips of ivory. Tipperah.  
 Fan made of strips of ivory. Tipperah.  
 Fan of split straw. Monghyr.  
 Painted palm-leaf fan. South India.  
 Khus khus fan, embroidered with silk. Poona.  
 Two fans of tinsel and silk fringe. Madras.  
 Two palm-leaf sun shades. Madras.  
 Chowrie, split peacock quill. Poona.  
 Chowrie, split peacock quill. Poona.  
 Chowrie, split peacock quill, with silver handle. Hyderabad. Decca.  
 Chowrie, yak tail. Punjab.  
 Chowrie, split ivory. Sylhet.  
 Chowrie, split sandal wood. Madras.

**FANCY LEATHER WORK. Class 255.**

Leather box, embroidered with quill work. Simla.

**ARMS. Class 265 and 268.**

Small barbed spear.  
 Small barbed spear.  
 Large spear head. South of India.  
 Spear with pistol attached.  
 Steel spear.  
 Steel spear.  
 Spear with bamboo shaft.  
 Spear with bamboo shaft.  
 Leather case for arrows. Lahore.  
 Quiver with 24 arrows, green velvet, embroidered with gold. Lahore.  
 Quiver with 24 arrows, puce velvet, embroidered with gold. Lahore.  
 Coat of mail, steel and brass rings. Punjab.  
 Bow. Delhi.  
 Bow. Delhi.  
 Bow. Delhi.  
 Gauntlets (2). Punjab.  
 Arm cover, green velvet, embroidered with gold. Lahore.  
 Arm cover, crimson velvet, embroidered with gold. Lahore.  
 Battle axe, steel head and koof. Delhi.  
 Battle axe, steel head and koof. Nagpore.  
 Dagger, jumblea shaped, metal mounts, gilt. Deccan.  
 Iron mace, hilt inlaid with silver. Bengal.  
 Iron mace, shaft covered with leather. Bengal.  
 Small sword, with carved blade and ivory hilt. Coorg.  
 Sword and leather scabbard.  
 Sword and wooden scabbard.  
 Sword and wooden scabbard. Malayan Archipelago.  
 Short sword and wooden scabbard, with knife inserted in sheath.  
 Sword and wooden scabbard. Burmah.

Sword, inlaid with gold, and velvet scabbard.  
 Sword with horn handle. Malayan Archipelago.  
 Sword and scabbard mounted with silver. Bengal.  
 Breastplate (2). Lahore.  
 Breastplate (2). Lahore.  
 Helmet, steel and brass rings. Punjab.  
 Matchlock, Kooft, and mounted with silver. Rajpootana.  
 Matchlock barrel, and mounted with silver. Rajpootana.  
 Matchlock, silver mounts. Punjab.  
 Matchlock, barrel washed with gold. Punjab.  
 Bayhmak, Gwalior. (India Museum.)

#### MATERIA MEDICA. Class 272.

Mossed bark. *Cinchona succirubra*. Neilgherries.  
 Cinchona bark. *Cinchona succirubra*. Neilgherries.  
 Cinchona bark. *Cinchona succirubra*. Kangra.  
 Calisaya bark. *Cinchona calisaya*.  
 Neem bark. *Azadirachta Indica*.  
 Conessi bark. *Holarrhena antidysenterica*.  
 Satween bark. *Alstonia scholaris*. Bombay.  
 Nux vomica bark. *Strychnos nux vomica*.  
 Pomegranate bark. *Punica granatum*.  
 Chiretta. *Ophelia chirayta*.  
 Indian sarsaparilla. *Hemidesmus Indicus*.  
 Guluncha. *Tinospora cordifolia*.  
 Pareira brava. *Cissampelos pareira*.  
 Columba root. *Jateorhiza columba*.  
 Asgund. *Physalis somnifera*.  
 Liquorice. *Glycyrrhiza glabra*. Bombay.  
 Pellitory. *Anacyclus pyrethrum*.  
 Jatamansi. *Nardostachys Jatamansi*. Madras.  
 Mishmee teeta. *Coptis teeta*. Assam.  
 Bish. *Aconitum ferox*. Himalayas.  
 Aconite. *Aconitum napellus*.  
 Bish. *Aconitum ferox*. Nepal.  
 Atees. *Aconitum heterophyllum*.  
 Black mooslie. Kala mooslie. Source unknown.  
 Mooslie seeah. *Murdannia scapiflora*.  
 Galinga. *Alpina galanga*.  
 Indian pennywort. *Hydrocotyle Asiatica*.  
 Tinnevely senna. *Cassia lanceolata*.  
 Senna. *Cassia acutifolia*. Bombay.  
 Patchouli. *Pogostemon patchouli*.  
 Croton seed. *Croton tiglium*.  
 Chaul moogra. *Hydnocarpus odoratus*.  
 Gaub fruit. *Embryopteris glutinifera*.  
 Nux vomica. *Strychnos nux vomica*. Madras.  
 Poppy heads. *Papaver somniferum*. Behar.

The seeds yield by expression about 50 per cent. of a bland and very valuable oil, of a pale golden colour, fluid to within 10° of the freezing point of water. It dries easily, is inodorous, of agreeable flavour, and partially soluble in alcohol. The seed is worth about 61s. in the English market. By simple exposure to the rays of the sun in shallow vessels the oil is rendered perfectly colourless. It is expressed by means of a heavy circular stone, placed on its edge, made to revolve by a long lever, and the apparatus is worked by draught bullocks.

The seed has no narcotic qualities, but has a sweet taste, and is used, parched, by the lower class of natives as a food; it is also much used by the sweetmeat-makers as an addition in their wares.

Muenphue. *Randia dumetorum*.  
 Colocynth. *Citrullus colocynthis*.  
 Cassia fistula. *Cathartocarpus fistula*.

Tamarinds. *Tamarindus Indica*.  
 Star anise. *Ilicium anisatum*. Bengal.  
 Betel nuts. *Areca catechu*.  
 Sliced betel nuts. *Areca catechu*. Mysore.

The nuts of the *Areca* palm form the principal ingredient in the famous Oriental masticatory. These are gathered between August and November, removed from the husks in which they grow, and are then boiled till soft, are taken out, sliced, and dried in the sun.

Kamala. *Mallotus Phillipinensis*.  
 Oak galls of *Quercus infectoria*.  
 Agar agar. *Eucheuma spinosum*. Malacca.  
 Ceylon moss. *Gracilaria lichenoides*. S. India.  
 Mysore gamboge. *Garcinia pictoria*. Mysore.  
 Pipe gamboge. *Garcinia morella*.  
 Ammoniacum. *Dorema ammoniacum*.  
 Cocum butter. *Garcinia purpurea*.  
 Rusot. *Berberis Asiatica*. Nepal.  
 Aloes. *Aloe vulgaris*. Bombay.  
 Henbane. *Hyoscyamus niger*.  
 Untamool. *Tylophora asthmatica*.

Bhang and Ganjah. *Cannabis sativa*.

The dried leaves of the hemp plant are called "Bhang," and the flower-tops with their resin, "Ganjah." The dried leaves are sometimes smoked alone or mixed with tobacco, but the more common form of taking bhang is to make it up with flour into a cake or a sweetmeat called, "Majun." Eating this sweetmeat produces great excitement and mania in persons unaccustomed to their use.

Cashmere saffron. *Crocus sativus*. Cashmere.  
 Mowha flowers. *Bassia latifolia*. Madras.  
 Cloves. *Caryophyllus aromaticus*. Penang.  
 Bael. *Ægle marmelos*. Bombay.  
 Lemon rind. *Citrus limonum*.  
 Singhara. *Trapa bispinosa*. Bengal.  
 Coriander. *Coriandrum sativum*.  
 Ajowan. *Anethum sowa*.  
 Bishop's weed. *Anethum sowa*.  
 Carraways. *Carum carui*.  
 Henbane seed. *Hyoscyamus niger*. North India.  
 Ispaghul. *Plantago ispaghula*.  
 Dhatoora. *Datura alba*. Bengal.  
 Gockroo. *Tribulus lanuginosus*. Bombay.  
 Cardamoms. *Elattaria cardamomum*. Mysore.  
 Cardamoms. *Cardamomum medium*. Calcutta.

The Official, or Malabar Cardamoms are well known in Europe for their medicinal uses, but in India they are equally appreciated and used as a spice or flavouring ingredient, entering into the composition of many native dishes. The plant is a native of the Western Coast, and is cultivated in Malabar. In the Travancore forests it is found at elevations of 3,000 to 5,000 feet. The mode employed for obtaining cardamoms is to clear the forests of trees, when the plants spontaneously grow up in the cleared ground.

Black pepper. *Piper nigrum*. Travancore.  
 Cubebs. *Piper cubeba*.  
 Coculus Indicus. *Anamirta coculus*.  
 Juniper berries. *Juniperus communis*. Himalayas.  
 Neil Kalmee. *Pharbitis nil*.

#### OPIMUM.

"The cultivation of poppy in India can be traced back as far as the sixteenth century. An allusion is made to the opium and saltpetre monopolies of the Emperor Akber in the reign of Queen Elizabeth, in the celebrated Ayeen Akber of Abul Fuzul, prepared during the latter part of the sixteenth century.

The poppy plant has been cultivated in Nepaul for years, doubtless for as long or longer than in Bengal and the North-western Provinces; and it may be that the opium from India was first introduced into China by the Nepaulese, and afterwards by the Dutch, who used to purchase the drug for export, long before the East India Company held possessions in India.

The process of the manufacture in India at the present day is as follows :—

About the end of January the poppy plant commences to flower, and continues till March; the petals are watched, and are carefully collected in the following manner,—

The forefinger and thumb encircle the stem just beneath the pod, and with the other fingers drawn inwards a kind of tube is formed; this tube is then gently raised straight over the pod, and if the petals are matured, they come off. They are never plucked off, as it would injure the pod. When a sufficient quantity has been collected in this manner, the cultivator proceeds to manufacture them into flat cakes something like pancakes, or, as they are technically termed, flower-leaves, and the opium cakes are wrapped in these leaves.

The manufacture of the flower-leaf is simple and inexpensive. A circular-ridged earthen plate, about 12 inches in diameter, is placed over a slow fire, the required quantity of petals is then placed in it, and pressed with a damp cloth pad till they have adhered together; the flower-leaf is then removed and allowed to dry, when it is ready for use in the manufacture of opium.

In February the poppy plant is pretty well advanced, and the prospects of the season can then be fairly ascertained.

In some instances in January, but generally in February and March, the pods mature, and are lanced in the afternoon; the opium is allowed to exude and remain on the pod till the next morning, when it is scraped off gently with a small iron scraper, and the thumb or finger is then run over the incisions to close them. The number of incisions required to complete exudation of all the juice varies, and ranges from one to five and six, and occasionally to seven and eight in some isolated cases. The opium thus collected is placed in earthen or brass vessels slightly tilted, to drain off the dew and any opium juice it may contain; and when the whole of the drug is collected and thus treated, it is carefully manipulated, put into a new earthen pot, and set aside in some ventilated and safe place. Should the opium be of low spissitude, it is exposed in some shady place (not in the sun), turned over occasionally and very carefully, so as not to injure the grain, and is so treated till it reaches the required consistency, and remains in the custody of the cultivators until it is weighed.

After the opium has been extracted, the pods are allowed to dry, and are then broken off, and the seed collected. An ample quantity is kept by the cultivator for next season's sowings, and the remainder disposed of to traders.

The leaves of the plant are left on the podless stalks, and when withered are collected and delivered into the Government opium factory, and termed technically *trash*, for packing the opium balls in the chests, for which payment is made at the rate of annas 12 a maund.

The flower-leaves are weighed in March and April, and are sorted into classes. The first is of fine texture and colour, and from 8 to 10 inches in diameter; the second slightly inferior in both texture and colour, and the third is of a roughish and thicker quality; as sorted they are weighed, and the weight of each quality is entered in the leaf weighment book, when the value of each quality is calculated at the rate of Rs. 10, Rs. 7, and Rs. 5 a maund.

The flower-leaves are despatched by country boats or carts to the factory at Ghazeepore, and on arrival are weighed, examined, and classified.

Before the opium weighments commence, the several books are prepared; new earthen jars and pots, with covers, are purchased and carefully weighed; coarse cloth, sealing wax, and twine for closing and sealing the jars, and baskets for holding the filled jars, are also purchased; every scale, beam, weight, pan, and reservoir is carefully examined and tested, and then the weighments take place.

After the opium has been brought in by the cultivators, it is tested, and samples of each consignment are taken for a careful chemical analysis to the opium examiner's room to detect adulteration. The opium is then stored in large wooden vats.

The pure opium, which is fit for the China provision, and the consumption of the local market, is stored in large wooden vats, each holding about 50 maunds (about  $1\frac{1}{2}$  tons weight); the opium derived both from the assameewra and chullan sources is not stored anyhow, but each parcel according to its class is emptied into a vat bearing the designation of that class; the light divisions are arranged in lines.

As much opium as can be removed from the vessels by light scraping is taken, that which adheres is afterwards removed by second scraping, and set aside for lewah, and that which persistently adheres is removed by water; this is called washings, and when evaporated is used in making lewah; the washings alone are valued at about Rs. 65,000 a season at Ghazeeopore Factory, and the opium thus recovered amounts to over one ton in weight.

When a vat is filled, the opium in it is stirred by long wooden poles daily until the drug is used for caking.

When there are about 2,000 maunds (about 75 tons) stored—we have accommodation for upwards of 6,000 maunds—we can, if we possess the proper quantities of the various consistencies, commence caking. One may ask, but why have you not caked before you collected so much? The reply is, we are bound by order to cake at a consistence of  $70^{\circ}$ ; that is, when the opium contains 70 per cent. of the pure dry drug and 30 per cent. water. We are allowed—as it is very difficult to hit off the consistence of  $70^{\circ}$  exactly when manipulating such a large quantity (nearly three tons) as we require daily for caking—to cake when the assay shows the opium to be above  $69^{\circ}50'$  and under  $70^{\circ}50'$ , so that we are allowed half a grain above and below the standard of  $70^{\circ}$ .

To prepare the opium for caking, a certain number of vats are marked of each class; a long iron instrument, something like a cheese-taster, is thrust from the top to the bottom of the vat (it forms half a hollow cylinder when open, and a complete cylinder when shut), and closed; the sample of opium is withdrawn, the contents of the sample drawn are thoroughly mixed up, and three specimens of 100 grains are assayed; the mean of the three results is taken as the correct consistence. By the same process the samples from all the vats, which have been marked, are taken and assayed; those which will give, when mixed together in certain proportions (by rule of alligation), opium at a consistence of  $69^{\circ}30'$  or  $69^{\circ}40'$  are exported to the alligation vats, and the contents of the selected vats are equally distributed over the seven alligation vats, so that the consistence of each may be uniform; the opium is then well mixed by rakes and by men walking about in it, and kneading it with their feet. At about 3 p.m. it is removed from these vats into the five caking vats; equal quantities being taken from each of seven alligation vats are distributed over the five caking vats. On the following morning the opium in each vat is again mixed by six men allotted to each from 5 a.m. to 8 a.m. Four samples are drawn from each vat, and thoroughly incorporated together, and three specimens from this mass are taken for assay; this pertains to every caking vat. Should the whole of the assays of each caking vat come out above  $69^{\circ}50'$  and under  $70^{\circ}50'$ , the agent of the Ghazeeopore Factory gives the order to cake, or in his absence the principal assistant does so.

The cultivation of the poppy plant is rendered as far as possible both profitable and popular.

A large room, 944 feet long by 27 feet wide, accommodates the 250 cake-makers; each cake-maker has a number and a place assigned for him to work at, the cake-maker's number being printed on the wall above his seat. Each man is provided with a wooden seat, and is furnished with a brass cake mould, forming the half of a hollow sphere; he has also a tin vessel graduated so as to hold  $4\frac{1}{2}$  chittacks of lewah, the regulated quantity which is used in making the shell of each cake.

The opium produce per beegah ranges from one to fifteen seers, according to the quality of the soil, and the attention and care bestowed on the cultivation, and state of the weather. The profit varies and ranges from Rs. 1 to Rs. 50 or upwards per beegah.

The following materials are used in making a cake, and as it is necessary that every cake should be of the same weight, viz., two seers, every precaution is taken to ensure the accurate determination by weight or measure (calculated

for weight from actual experiments) of the articles which compose the cake. The proportion of each article is given in the table below :—

	Seers.	Chittacks.
Standard opium at 70 - - -	1	7.5
Lewah at 53 - - -	-	4.5
Flower-leaves - - -	-	5.0
Water - - -	-	.5
Trash - - -	-	.25
Total weight of cake on the } day of manufacture - - }	2	1.75

The lewah now demands attention. Lewah is a paste made by breaking down opium in water which has been used for removing the traces of opium which adhere to the jars and vessels in which opium has been placed; this is called washings or technically *dhoe*; the washings contain about 8 to 10 per cent. of opium; the opium is broken down in large vats containing about 800 cubic feet, and about 8 per cent. of pussewah is added to the lewah to render it smooth and glutinous.

When the lewah has a consistence of over 52.50 and under 53.50, it is called standard lewah; its consistence is determined every morning by assay, and until it is of the proper degree, caking cannot commence.

The lewah is delivered in bulk by weight, and the quantity to be used for each cake is measured by a brass cup which delivers 4½ chittacks at 53°.

The poppy flower-leaves agglutinated by the lewah form the shell of the cake; five chittacks of dry leaves are required for each cake; but as the leaves vary in weight according to the amount of moisture in the atmosphere, ten seers are steam-dried daily to ascertain how much moisture they contain; knowing this, an exact increase or decrease in the weight of leaves can be made, which is required to compensate for the moisture contained. This control is necessary, since if five chittacks of leaves are used, which contained much moisture, when the leaves parted with that moisture by evaporation in the dry months, the cakes would be light.

The loss in weight which the leaves sustain by steam-dryings is determined on the day previous to their being required for use; the bulk required for the caking of the next day is weighed out and damped in the afternoon, so as to render the leaves supple and pliant; when dry they are crisp and break readily.

Having explained the preliminaries of caking, the method will now be described. Down the centre of the room the scales for weighing opium and the lewah vats are placed; there is a weighman for each scale, and two assistants; the weighman weighs the opium on a very delicate scale, and one assistant searches the opium to ascertain finally that there are no extraneous matters in it; the second man arranges the moveable tin pan, and places the opium on it.

When caking commences the caking vat room doors are opened, and the opium is brought out in tinned sheet-iron vessels holding 20 lbs. each. One vessel is set before every scale, and a sufficient quantity for one cake having been searched is handed over to the weighman's second assistant, who adjusts the quantity in the pan. When the weighman declares it to be correct the tin plate with the opium is taken away by a boy to his cake-maker, who has been supplied in the meantime with a tin cup filled with the requisite amount\* of lewah for a single cake; he has also received the proper quantity† of leaves for one cake. Having these by his side, he now rapidly forms in the brass mould the lower half of the shell of a cake, pasting by means of the lewah, leaf over leaf, until the thickness of about seven-sixteenths of an inch has been obtained. He allows in so doing the upper part of some of the leaves

\* 5 chittacks.

† 2 chittacks.

which he tears in half and places vertically, to hang down outside the mould (with these he forms the upper half of the cake). The cake shell is principally made of half leaves vertically placed, other halves being inserted horizontally so as to give equal strength in all directions. Having finished the lower half of the shell he takes the tin plate and accurately, to a grain, removes the opium into the half of the shell now ready for its reception; it is pressed upwards into the shape of a cone, some pieces of leaves are applied horizontally to it, then some lewah, now some of the parts of the leaves hanging down are pulled up and secured, more pieces are applied horizontally, and at last, having pulled up and properly arranged all the pieces of the leaves which were hanging around the cup, a whole leaf is applied to the top, and the cake is now finished.

It is a sphere of about the same size as a 24-lbs. spherical shot; it is removed from the mould and dusted with a little coarsely powdered poppy trash, so as to prevent its adhesion to the cup, made of burnt unglazed pottery, which is of the same shape as the mould in which the cake was made. It is now carefully placed in the cup while still soft, and it is carried out by the cake-maker's boy, who puts it in the sunshine on a little square of brick flooring, which has been allotted to the cake-maker whom he serves, and where a small board stands bearing his master's number.

Before removal a paper ticket is pasted on the cake bearing the cake-maker's number, and the date on which it was made; every cake has its ticket, so that we can at any time trace its history, and by this means we can hold every cake-maker responsible for the careful manufacture of his cakes; by means of these tickets, should anything be found wrong with any cake, it can be brought home to the man who made it.

The caking begins generally at 10 A.M., and lasts till half-past one or two o'clock in the afternoon; usually 20,000 cakes are made daily.

The cakes are on the evening of the second day counted and sent to their destination in one of the cake godowns, where they and their cups are stored in rakes.

The great object to be attained is to make the cake as carefully and compactly as possible by one operation, to have the shell even in thickness throughout, and to spread the lewah uniformly between the leaves. This can be attained by good cake-makers under strict supervision; cake-makers usually make 60 cakes a day; every good cake-maker gets 20 or more additional ones to make, for which they receive an extra allowance.

The flower-leaf forms an excellent covering; it is in every way suitable, but it has its drawbacks. It is affected by wet, and is liable to be attacked by mildew, borers, and white ants, while it will not resist hard pressure applied to any small area of its circumference; however, it certainly most effectually retains the moisture and aroma of the drug enveloped in it, and by its own fragrance adds to that which the opium *per se* contains.

The cake godowns are large and high brickwork buildings, with galvanized iron roofing, well ventilated by numerous windows and doorways. The windows have iron gratings fixed in the masonry outside, and skeleton doors are provided for the best godowns to admit of the entrance being closed while free perfilation of air is not interfered with. All the doors and windows of the better class godowns are further secured from thieves by galvanized wire netting, so that cakes cannot be cut up and passed out in large pieces.

Inside the godowns are wooden racks, extending nearly up to the roof; there are intervening rectangularly-placed passages traversing the frames to permit of ventilation. In these racks the cakes are stored in their cups.

Every third day the cakes, wherever placed, come down to the ground, are lightly hand-rubbed with a little trash, turned, replaced in their cups, and sent up again to be placed in the racks. The object of turning is to allow the shell of the cake to dry evenly.

The packing takes place only in dry weather, and after the morning dew has been dispersed.

Into a strong mango-wood chest, one yard long and two feet four inches wide, 40 cakes are packed in two layers of 20 each; the balls are prevented from rolling about by each one being placed in a compartment; and in these chests, varying in number according to the year, the opium cakes find their

way to Calcutta, whence they are shipped to China at the close of the annual Government sales, each chest realising as much as 30l., or in other words 1,000 rupees, in an average good season. (*R. Saunders, Collector of Ghazee-pore, 1873.*)

*Papaver somniferum.* Behar.

Ball as prepared for the Chinese market, called "Provision Opium."

Blistering beetles (*Mylabris sp.*). Madras. Used as a substitute for European cantharides in Indian Hospitals.

#### WOODEN AND BASKET WARE; PAPIER-MÂCHÉ. Class 289.

Three catjan-leaf baskets. Madras.  
 One catjan-leaf basket. Madras.  
 Catjan-leaf cigar case. Madras.  
 Cane stand, with compartments. Singapore.  
 Two grass window-shades. Travancore.  
 Three cane baskets. Monghyr.  
 Straw baskets. Monghyr.  
 Cane bottle-stand. Singapore.  
 Papier-mâché dome-shaped box. Cashmere.  
 Papier-mâché cigar case. Cashmere.  
 Papier-mâché jewel box. Kurnool.  
 Papier-mâché pen case (Kalumdan). Hyderabad, Sindh.  
 Papier-mâché pen case (Kalumdan). Hyderabad, Sindh.  
 Lacquered wood charpoy leg. Sindh.  
 Lacquered wood charpoy leg. Sindh.  
 Lacquered wood box. Burmah.  
 Lacquered wood box. Burmah.  
 Lacquered wood box. Burmah.  
 Lacquered wood box. Burmah.  
 Lacquered wood box. Hyderabad, Sindh.  
 Lacquered wood box (bamboo). Burmah.  
 Lacquered wood box (3 in 1). Sindh.  
 Lacquered wood box. Sindh.  
 Lacquered wood box (5 in 1). Sindh.  
 Lacquered wood box. Sindh.  
 Lacquered wood box (oval with ivory studs). Punjab.  
 Lacquered wood box (oval). Sindh.  
 Lacquered wood map case. Sindh.  
 Lacquered wood, 3 solid and 1 hollow balls. Madras.  
 Lacquered wood table. Sindh.  
 Japanned cabinet. Bareilly.

W Fancy articles, boxes, &c. of turned wood, and lacquered in various colours. The object to be lacquered is turned from hard wood, usually shisham (*Dalbergia*). After being smoothed and cleaned it is again fixed in the turner's frame (a kind of lathe worked by hand), and made to rotate. The sticks of lacquer colour, consisting of a mixture of lac, resin, colouring matter, and, it is said, a certain proportion of sulphur and bees' wax, are then applied to the rotating object; the heat produced by friction is sufficient to soften the lacquer composition, which attaches itself to the wood, producing, however, a dull and streaky appearance. When sufficient colour has been applied, the surface of the article is skilfully rubbed with a piece of bamboo having a fine edge, by which the colour is evenly distributed, and a polish produced, which is finally completed with oiled rags. To produce the mottled appearance so much admired, a colour stick of a rather harder composition than that used for producing a uniform colour is lightly pressed against the rotating object, so as to detach a point here and there. This is repeated with sticks of different colours, and when sufficient colour has been laid on, the object is polished with bamboo edges and oiled rags.

#### PLEASURE CARRIAGE. Class 292.

Model of state carriage (Ekka). Poona.

**TRAVELLING VEHICLES. Class 293 and 294.**

Model of covered passenger cart. Bombay.  
 Model of palanquin. Bombay.  
 Model of luggage cart. Bombay.

**SADDLERY. Class 296.**

Sikh saddle (green velvet and gold trappings). Punjab.

**BOOKS ON SPECIAL SUBJECTS RELATING TO INDIA, PUBLISHED BY THE INDIA MUSEUM. Class 305 and 306.**

The People of India. By J. Forbes Watson, LL.D., &c., and Sir John W. Kaye. 8 vols. roy. sup. 4to.  
 The Textile Manufactures of India. By J. Forbes Watson, LL.D., &c. 1 vol. sup. roy. 4to.  
 Tree and Serpent Worship. By J. Fergusson, F.R.S. 1 vol. sup. roy. 4to.  
 Ancient Buildings in Kashmir. By Lieut. H. H. Cole. 1 vol. 4to.  
 Ancient Buildings near Muttra and Agra. By Lieut. H. H. Cole. 1 vol. 4to.  
 Report on the Archæology of W. India. By J. Burgess. 1 vol. 4to.  
 Primitive Tribes of the Nilagiris. By J. W. Brecks. 1 vol. 4to.

**DEPARTMENT III.—EDUCATION AND SCIENCE.****MUSICAL INSTRUMENTS. Class 327.**

Lither. Madras.  
 Sarangi (stringed instrument). Madras.  
 Kanaga Tappu (instrument of percussion). Madras.  
 Timiri Nagasuram (wind instrument). Madras.  
 Hanumanta Ottu (wind instrument). Madras.  
 Horn. Moorsshedabad.  
 Kettle drum. Bengal.

**TOPOGRAPHY; MAPS. Class 335.**

A series of maps illustrative of Indian surveys.  
 10 frames containing photographs of views, &c. in India.  
 Relief map of India (small size, coloured).

**PEOPLE OF INDIA. Class 340.**

12 frames, containing photographs of the Races and Tribes of Hindustan. (These photographs form a portion of the illustrations from the work on the People of India, by J. Forbes Watson, M.A., M.D., LL.D., and Sir John W. Kaye, F.R.S. 8 vols. sup. roy. 4to. 2l. 5s. per vol. W. H. Allen, London.)

**ARCHITECTURE. Class 342.**

15 frames containing photographs illustrative of Indian architecture.

## DEPARTMENT IV.—ART.

## SCULPTURE. Class 400.

Sculptured stone bull (Nandi).

## ANCIENT SCULPTURE. Class 401.

Sculptures from the Amravati Tope, viz. :

Base of large slab (carved with figures).

Small panel-figure of temple with Buddha seated.

Two portions of frieze.

Portion of frieze.

Portion of frieze (figures carrying wreath).

Figure, standing.

The Amravati Tope is situated on the bank of the Kistna River in Guntoor, Madras, and was discovered in 1797 by Colonel Mackenzie. The sculptures were excavated in 1840 by Sir Walter Elliot. Their history will be found in Fergusson's "Tree and Serpent Worship," London, 1873.

Sculptured slab. Buddha's feet.

## CARVINGS IN WOOD, IVORY, &amp;c. Class 405.

Carved black-wood model of Buman Chuttree, a place where attendants seek shelter when the bodies of the dead are being burned. Booj, Kutch.

Carved sandal-wood model of Hindoo temple. (Kullyaneeshion.) Booj, Kutch.

Carved black-wood vase. Bombay.

Idol, carved stone (Vishnu riding on Garuda). Madras.

Idol, carved wood (Vishnu). Nepal.

Idol, carved wood (Chandra). Nepal.

Carved pith figures. Barber, shbemaker, and birdseller. Trichinopoly.

Carved sandal-wood glove box. Bombay.

Carved sandal-wood fan. Bombay.

Carved ivory box. Burmah.

Carved elephant with howdah. Berhampore.

Carved horn tazza. Gokah.

Carved horn drinking cup. Rutnagherry, Bombay.

## INLAID WORK IN STONE. Class 450.

Inlaid marble box. Agra.

Inlaid marble box. Myhere.

## INLAID WORK IN WOOD, METAL, &amp;c. Class 452.

Glove box. Bombay.

Work box. Bombay.

## NOTE ON INLAID WORK.

This work, according to Framjee Heerjeebhoy and other craftsmen of the trade, was imported into Bombay from Persia through Scinde, and it seems from inquiries made by Dr. Birdwood on a previous occasion, that they all agree in naming Shiraz as the place from which it emanated. Three Mool-tanees, Devidas and Vulleeram, brothers, and Pershotum Heeralal, were the first, it would seem, who settled about a hundred years ago in Scinde, where Kuntaree or Soortee people acquired the art under them, and came to Bombay about sixty years ago, from whence they spread to Surat, Baroda, and other places. The trade now is merely imitative, new geometrical combinations are seldom thought of, the workers content themselves with simply copying the forms which were imported from Persia. Manoredas, Nundlal, Lalchund, Thawurdas, Ruttonjee, Pranvulubh, and Narrondas are said to have been the first who introduced the work into Bombay. A number of Parsees and Soortees have since been educated by them. Dr. Birdwood gives a list of

fifty shops now carrying on the business in Bombay, giving employment to about a hundred and twenty people.

This work is composed of the following materials :—Ivory, which is always white ; Samber Horn (Sawursing), which is always green ; the colour is produced by steeping it in verdigris dissolved in lemon juice, toddy, or vinegar.

Sandal-wood used in its natural colour.

Ebony, on account of its colour.

Pattung—Sappan-wood—according to Dr. Birdwood “the wood of *Caesalpinia Sappan*.” This wood is of a rich burnt sienna colour, and seems to have been unknown to the Persian workers, as vermilion is substituted for it.

Mineral—Tin (the Persians use brass instead), in imitation of silver. This is generally purchased round, and passed through a roller known by the name of Rat, the lower wheel of which is cut in several places, forming more or less acute angles, the upper wheel being smooth ; the tin issues from it in a triangular shape. This and all the other materials partake of the shape of the square, the rhombus, the isosceles, equilateral, and right-angle triangles. Segmental forms are sometimes given to the ivory, sandal-wood, and ebony filling in ground, so as to admit of circular designs. The tin employed is sometimes round, when used as a border, and is then known as “Ekdani,” which means one line, and forms a succession of round dots. The sandal-wood is never introduced in borders, but is employed in the larger patterns ; the materials are glued together into various geometrical forms, consisting of circles, hexagons, the square, the rhombus, and the triangle ; the glue usually used in preference to all others is Ahmedabad glue, which is considered by native workers stronger than any manufactured in the country or imported from Europe. It is dissolved in brandy or spirits of wine. The length of the pieces glued together is generally two feet, and these are sawn off in sections with delicate saws in widths varying between the 15th and 20th part of an inch. These are glued on to sandal-wood about a quarter of an inch thick, the latter is fastened on to black-wood (Sissoo), teak-wood (Saag), or deal (Deodar). Not unfrequently the whole box is made of sandal-wood, but this adds materially to the expense. Some of the designs are known under the names of—

Mhotee Kutkee-no-gool—A design of comparatively large hexagons. The prefix Kutkee is applied to the work when sandal-wood and ebony are introduced.

Adhee Dhar-no-gool—The rhombus.

Tun Dhar-no-gool—The triangle.

Chorus-gool—The square or matting pattern.

Gool—Round.

Poru Hansio, Jafran Marapect, Sankro Hansio, Lehero, Jeri, Ekdani, and Baelmootana are names applied to borders.

A cheap white wood known as “Dooblo” has been tried as a substitute for ivory, but its use has been discontinued, as it does not answer : it is, however, still used in the Ceylon inlaid woodwork.”

Card basket of porcupine quill work. Vizagapatam.

Box of porcupine quill work. Vizagapatam.

Bowl and cover of Bidri ware. Hyderabad.

Spittoon of Bidri ware. Hyderabad.

“Bidri” (from *Bider*, in the Deccan, where this art-industry is said to have been first practised in India) is the name given at Purneah to a composite metal, the chief component of which is zinc. With this is mixed, in small quantities, copper and lead. Roughly the proportion may be given thus :—In every 13 oz. of the compound metal rather more than 12 oz. would be zinc ; rather more than  $\frac{1}{2}$  an ounce would be copper, and less than  $\frac{1}{2}$  oz. would be lead. Upon vessels and other articles made in this composite metal, patterns are traced and cut out in shallow intaglios by chisels of various shapes, and the hollows so formed are filled with thin silver plates which are made to adhere firmly to the bidri ground by the use of hammer and punch. The work then receives a polish by friction, first with cakes composed of lac and powdered corundum, and finally with charcoal ; after this the ground or bidri metal receives a permanent black colour by being rubbed with a paste of which the chief ingredients are sal ammoniac and nitre. This blackening of the

bidri ground not only heightens the effect of the silver inlay, but prevents the tarnish which otherwise would in time disfigure the ground. The industry is of Mahomedan introduction, and Purneah has long been celebrated for it.

Casket of Koftgari ware. Sealkote.

Basket of Koftgari ware. Sealkote.

*Process of Manufacture of Koftgari Ware* (Steel inlaid with Gold).—The pattern on the steel is engraved by the hand with a fine-pointed tool, called "cherma." The golden is beaten out into a very thin wire, which is laid into the design so engraved. The surface is next scraped to an exact level, by an instrument called "Tor" or "Silat." The article is then exposed to a moderate amount of heat, and when taken from the fire is rubbed and polished with a smooth stone called "mohari" (Punjab Catalogue). Koftgari work is produced chiefly in Goojerat and Sealkote, in the Punjab; that of the latter place being distinguished by higher finish. It was formerly much in vogue for the decoration of arms, but as the manufacture of arms has been generally discouraged since the rebellion in India, its application is now chiefly confined to the ornamentation of fancy articles, such as paper-knives, paper weights, jewel caskets, &c.

#### PAINTINGS ON IVORY, LEATHER, AND MICA, &c. Class 454.

Twelve miniature paintings on ivory (buildings), mounted in carved sandwood frame. Delhi.

Three writing pads of ornamental painted leather. Kurnool.

Paintings on mica (in frame). Trichinopoly.

Eleven samples of Caligraphy or ornamental writing in colours. India.

### DEPARTMENT V.—MACHINERY.

#### MODELS OF BOATS. Class 594.

(Bhar.) For heavy cargo. Calcutta.

(Hudi.) Used in coasting about Chittagong. Calcutta.

(Balam boat.) Deep-water passenger boat. Calcutta.

(Budgerow.) Passenger boat. Calcutta.

(Mayur Panki.) Peacock-prowed boat. Calcutta.

(Khega Dhing.) Ferry boat. Calcutta.

### DEPARTMENT VI.—AGRICULTURE.

#### ARBORICULTURE AND FOREST PRODUCTS.

#### ORNAMENTAL AND OTHER WOODS. Class 601.

##### WOODS.

Acacia Arabica. Babool.

Acacia catechu. Khair.

Acacia diluta.

Acacia julibrissin.

Acacia leucophœa.

Acacia marginata.

Acacia paludosa.

Acacia spinosa.

Acacia sundra.

Acacia tomentosa.

Acacia sp.

Acacia sp.

Acer oblongum

Acrocarpus fraxinifolius.

Actephila Neilgherrensis.

Adenanthera pavonina.

Ægle marmelos. Bél.

Agati grandiflora.

Aglaia Midnaporensis.

Ailanthus excelsa.

Albizzia lebbek.

Albizzia odoratissima.

Albizzia procera.

Albizzia stipulata.

Albizzia sp.

Alstonia macrophylla.

<i>Alstonia scholaris.</i>	<i>Cambessedea oppositifolia.</i>
<i>Amygdalus communis.</i>	<i>Canarium Bengalense.</i>
<i>Anacardium occidentale.</i>	<i>Canarium commune.</i>
<i>Ancestrolobus carnea.</i>	<i>Canella alba.</i>
<i>Andrachne trifoliata.</i>	<i>Carallia integerrima.</i>
<i>Antidesma diandrum.</i>	<i>Carallia lucida.</i>
<i>Antidesma sp.</i>	<i>Careya arborea.</i>
<i>Aquilaria agallocha.</i>	<i>Casearia? pentandra.</i>
<i>Araucaria Cunninghamii.</i>	<i>Cassia fistula. Amaltas.</i>
<i>Areca catechu.</i>	<i>Cassia florida.</i>
<i>Artocarpus chaplasha.</i>	<i>Cassia grandis.</i>
<i>Artocarpus echinata.</i>	<i>Cassia Roxburghii.</i>
<i>Artocarpus hirsuta.</i>	<i>Castanea Indica.</i>
<i>Artocarpus integrifolia. Jack.</i>	<i>Castanea sp.</i>
<i>Artocarpus lakoocha.</i>	<i>Casuarina equisetifolia.</i>
<i>Artocarpus mollis.</i>	<i>Casuarina muricata.</i>
<i>Artocarpus polyphema.</i>	<i>Cedrela toona. White cedar.</i>
<i>Artocarpus sp.</i>	<i>Celtis Roxburghii.</i>
<i>Averrhoa carambola.</i>	<i>Chelonia sp.</i>
<i>Azadirachta Indica. Margosa.</i>	<i>Chickrassia tabularis. Chittagong wood.</i>
<i>Neem.</i>	<i>Cinnamomum iners.</i>
<i>Barringtonia sp.</i>	<i>Cinnamomum parthenoxylon.</i>
<i>Bassia latifolia.</i>	<i>Citrus decumana.</i>
<i>Bassia longifolia. Bassa.</i>	<i>Cleidion Javanicum.</i>
<i>Baubinia Malabarica.</i>	<i>Cocos nucifera.</i>
<i>Bauhinia purpurea.</i>	<i>Colvillea racemosa.</i>
<i>Bauhinia racemosa.</i>	<i>Combretum trifoliatum.</i>
<i>Bauhinia Richardiana.</i>	<i>Conocarpus acuminatus.</i>
<i>Bauhinia variegata.</i>	<i>Conocarpus latifolius. Dhowra.</i>
<i>Berrya ammonilla. Trincomallee.</i>	<i>Conocarpus myrtifolius. Kindahi.</i>
<i>Berrya mollis.</i>	<i>Conocarpus sp.</i>
<i>Betula sp.</i>	<i>Cordia Bantamensis.</i>
<i>Bignonia sp.</i>	<i>Cordia angustifolia.</i>
<i>Bischoffia Javanica.</i>	<i>Cordia latifolia.</i>
<i>Blighia sapida.</i>	<i>Cordia Macleodii.</i>
<i>Bombax Malabaricum. Seemul.</i>	<i>Cordia myxa. Sussora.</i>
<i>Bombax sp.</i>	<i>Cordia sp.</i>
<i>Borassus flabelliformis. Palmyra.</i>	<i>Cossignia Borbonica.</i>
<i>Boswellia serrata.</i>	<i>Cupressus funebris.</i>
<i>Briedelia Berryana.</i>	<i>Cupressus sempervirens.</i>
<i>Briedelia retusa.</i>	<i>Cupressus torulosa.</i>
<i>Briedelia sp.</i>	<i>Cynometra polyandra.</i>
<i>Briedelia stipularis.</i>	<i>Cynometra ramiflora.</i>
<i>Buchanania latifolia. Cherinji.</i>	<i>Dalbergia alata.</i>
<i>Butea frondosa. Palas.</i>	<i>Dalbergia lanceolaria.</i>
<i>Buxus sempervirens.</i>	<i>Dalbergia latifolia. Rosewood.</i>
<i>Byrsonima sp.</i>	<i>Dalbergia oojensis.</i>
<i>Byttneria sp.</i>	<i>Dalbergia ovata.</i>
<i>Cæsalpinia sappan.</i>	<i>Dalbergia sissoides.</i>
<i>Callicarpa arborea.</i>	<i>Dalbergia sissoo.</i>
<i>Callistemon salignum.</i>	<i>Fagraea fragrans.</i>
<i>Calophyllum bracteatum.</i>	<i>Heterophragma chelonoides.</i>
<i>Calophyllum sp.</i>	<i>Homalium tomentosum.</i>
<i>Calosanthos Indica.</i>	<i>Spathodea stipulata.</i>
<i>Calyptranthes sp.</i>	<i>Vateria Indica.</i>
<i>Calysaccion longifolium.</i>	

#### DYE WOODS. Class 602.

India produces a large variety, and amongst them the most valuable of organic materials for the use of the dyer. Those which are not indigenous have been introduced with success, and when we name indigo, cutch, madder, sappan wood, safflower, mangrove bark, nut galls, myrabolams, and many others, it will be judged that our "Empire in the East" has great resources

in dye stuffs. The collection sent to the present Exhibition is neither large nor numerous, but it is useful as an indication of the resources at command.

Sappan wood. *Cæsalpinia sappan*.

Wood of *Morinda tinctoria*. Madras.

Jack wood. *Artocarpus integrifolia*.

Cutch wood. *Acacia catechu*. Shahjehanpore.

Avarum bark. *Cassia auriculata*.

Bark of *Cassia fistula*. Cuttack.

2 samples of mangrove bark. *Rhizophora sp.* Burmah, and Singapore.

Aroogay bark. Madras.

Sambooram. Sindh.

Babool. *Acacia Arabica*.

Pupli. *Ventilago Maderaspatana*. Madras.

Chay root. *Hedyotis umbellata*. Nagpore.

2 samples Aal root. *Morinda citrifolia*. Central India.

The principal trade of Kotra in the Jaloun district is in the dye from Aal (*Morinda citrifolia*). The best soils for Aal are,—

Mar	-	-	-	-	-	Black soil.
Kabur	-	-	-	-	-	Ditto, with more clay.
Perooa	-	-	-	-	-	A reddish sandy soil.

The rate per acre is,—

Mar	-	-	-	-	-	Rs. 2	8	0
Ditto	-	-	-	-	-	2	0	0
Kahur	-	-	-	-	-	1	0	0
Ditto	-	-	-	-	-	0	12	0
Perooa	-	-	-	-	-	0	8	9

The seed of the Aal is sown in July. The land is first ploughed, then raked by the native harrow called *bakkar*.

The seed is then sown broadcast, to one beegah of land one maund of seed is given. The plant begins to show in one month, or in August.

It is weeded in September, October, and November following.

In the following July the soil round the young plants is turned up to allow them to grow and receive the rains.

The second year it flowers in August and September. The flower is white and sweet-smelling. The yield per beegah of seed is in the first year about 20 seers, and the two following years only 10 seers. The third year the plant is dug up. The roots go down about three feet. All other parts of the plant are of no use.

The roots are dug up in December, January, February, as may be required. The yield in roots per beegah is five maunds.

The roots are divided into three distinct sorts :—

1st. The best is the thinnest, called *bhára*; found at the greatest depth.

The yield is about one maund, valued at Rs. 8 per maund in the market; formerly it fetched Rs. 20 per maund.

2nd. The next size is called *jhurrun*. The yield is about 2½ maunds per beegah. It now fetches in the market Rs. 4 per maund. It formerly sold at Rs. 10.

3rd. This sort is thickest, is called *ghattea*. The yield per beegah is about 1½ maunds. It sells now at Rs. 8 per maund; formerly it fetched Rs. 9.

The three sorts are mixed in the following proportions :—

1st sort	-	-	-	-	-	1½ seers.
2nd do.	-	-	-	-	-	2 do.
3rd do.	-	-	-	-	-	3 do.

Then chopped up fine; then ground in a hard mill; and for each seer of root 2 ounces of alum are added. All are put into a vat holding 2½ maunds, or 28 gallons of water.

The cloth to be dyed is first washed. To one *than* (piece) of cloth, a quarter seer of castor oil and a quarter seer of fuller's earth (*sujjee*) are used, with

four seers of water, in which it is well stamped upon by the cheepie (cloth printer). The cost of this process by the cheepie is 3 pie per "than" of 8 yards.

In the root mixture above mentioned, fine *thans* of white country-made cloth called *pátul*, or fine *thans* of *mirkhani*, a better sort of cloth, are put, and allowed to remain for eight days. The cloth is moved up and down to make the dye equal throughout. After this the cloth is taken out, washed, and dried in the sun, and pressed.

The present market price of *pátu* is Rs. 1-8-0 per *than* of 87 yards, *mirkhani* is Rs. 2 per *than*. A profit of 2 annas per *than* is generally made in the markets of Hatrass, Pilibheet, and Lucknow. These cloths are used by women as head-coverings.

Munjeet. *Rubia cordifolia*. Nepal, Assam, and Bengal.

Munjeet. *Rubia munjista*. Bombay.

Madder. *Rubia tinctoria*. Madras.

4 samples of turmeric. *Curcuma longa*. Dehra-Doon, Bombay, Bengal, Bimlipatam.

Sample of round turmeric. *Curcuma longa*. Madras.

Sample of Bengal turmeric. *Curcuma longa*. Calcutta.

Sample of ground turmeric. *Curcuma longa*.

Mara munjil. *Coscinium fenestratum*.

Rutanjot. *Onosma echinoides*. N.W. Provinces.

Green dye. *Jatropha*. Malda.

Henna. *Lawsonia inermis*.

Ushurg. *Delphinium* sp. Lahore.

Sumac. *Rhus* sp. Cawnpore.

Dhawa flowers. *Grislea tomentosa*. N.W. Provinces.

Palas flowers. *Butea frondosa*. Burmah.

Palas flowers. *Butea frondosa*. Ahmednugger.

8 samples of safflower. *Carthamus tinctorius*, from Indore, Burmah, Hyderabad, Hooghley, Moorshedabad, Sarum, Dacca, Ahmednugger.

Ball safflower. *Carthamus tinctorius*.

Harsinghar. *Nyctanthes Arbor tristis*. Madras.

Divi Divi. *Cesalpinia coriaria*. Cawnpore.

Marking nuts. *Semecarpus anacardium*. Burmah.

Kamala. *Mallotus Philippinensis*.

Aomla. *Emblia officinalis*. Bombay.

3 samples of myrabolams. *Terminalia chebula*. Bombay, Calcutta, Bengal.

Beleric myrabolams. *Terminalia belerica*. Madras.

Crushed myrabolams. *Terminalia chebula*. Cawnpore.

Usneh. *Parmelia perlata*. Umritsur.

Chulcheleera. *Parmelia Kamtschadatis*. Bengal.

Orchella. *Roccella fuciformis*. Travancore.

Mochurrus. *Areca catechu*. Bombay.

Blue galls of *Quercus infectoria*.

Galls of *Terminalia chebula*.

Tamarisk galls. *Tamarix furas*. Bombay.

Pulas kino. *Butea frondosa*.

#### GUMS AND RESINS.—Class 603.

5 samples of sal dammar. *Shorea robusta*, from Central Provinces, Raepore, Gyah, Burmah, Chota, Nagpore.

6 samples of black dammar. *Canarium strictum*, from Madras, Coorg, Salem, Burmah, Cochin, I.

Pwai Nyet. *Canarium strictum*? Burmah.

Thingan. *Hopea odorata*. Pegu.

Resin. *Hardwickia binata*. Salem.

Dhoop resin. *Vateria Indica*. W. India.

5 samples of piney resin. *Vateria Indica*, from Mysore, Bangalore, Madras, Travancore.

Salai. *Terminalia* sp. Berar.

- Olibanum. *Boswellia Bhaudagiana*. Bombay.  
 Myrrh. *Balsamodendron myrrha*. Bombay.  
 Jalmaram incense. Salem.  
 False bensoin. *Terminalia angustifolia*. Bombay.  
 Muttipal. *Ailanthus Malabarica*. Bombay.  
 Dika Mali. *Gardenia gummifera*. S. India.  
 Asafoetida. *Narthez asafoetida*. Bombay.  
 2 samples of Mysore gamboge. *Garcinia pictoria*. Bombay.  
 Palas Kino. *Butea frondosa*. Central Provinces.  
 Banapu. *Terminalia tomentosa*. Madras.  
 Kino, inferior. *Pterocarpus marsupium*. Madras.  
 Kino. *Pterocarpus marsupium*. Madras.  
 Vengaygum. *Pterocarpus marsupium*. Madras.  
 Khaira. *Sterculia urens*. Indore.  
 Karree gum. *Sterculia urens*. Central Provinces.  
 2 samples of Kuteera gum. *Sterculia urens*, from Indore and Central Provinces.  
 Kicteera. *Cochlospermum gossypium*. Madras.  
 2 samples of Babool. *Acacia Arabica*, from Baroda and Central India.  
 4 samples of Babool gum. *Acacia Arabica*, from Calcutta, Gyah, Salem, and Central Provinces.  
 Kheir. *Acacia catechu*. Madras.  
 3 samples of Kheir gum. *Acacia catechu*, from Central Provinces, Goonah, Chutterpore.  
 Caroo Velai. *Acacia sp.* Madras.  
 Velai gum. *Acacia leucophlæa*. Madras.  
 Velai gum. *Acacia odoratissima*. Salem.  
 Gum of *Melia azadarach*. Salem.  
 Wood-apple gum. *Feronia elephantum*. Madras.  
 Woodier gum. *Odina wodier*. Central Provinces.  
 2 samples of woody gum. *Odina wodier*, from Bengal, N.W. Provinces.  
 Dowra. *Conocarpus latifolia*. Ahmedabad.  
 Kuthlia gum. Indore.  
 Veckale. *Conocarpus latifolia*. Madras.  
 2 samples of Dinduga. *Conocarpus latifolia*, from Salem and Madras.  
 2 samples of Dowra. *Conocarpus latifolia*, from Goonah and Central India.  
 2 samples of Chironjee. *Buchanania latifolia*. Central Provinces and Madras.  
 Gum of Chironjee. *Buchanania latifolia*. Berar.  
 Moorkalee gum. Salem.  
 Marking tree gum. *Semecarpus anacardium*. Salem.  
 Gum of *Macaranga tomentosa*. Madras.  
 Kattimandu. *Euphorbia cattemandu*.  
 Panchontee. *Bassia elliptica*. Madras.  
 Coorta gum. Source uncertain.  
 Gutta-percha. *Isonandra gutta*. Malacca.

These products have as yet not been fairly and completely sought out and developed in India. The supply could doubtless be very large, but so long as indiscriminate mixing and careless collection is the rule rather than the exception, the gums and resins of Indian forests will fail to secure a remunerative market.

- Stick lac, from various parts of India and Burmah.  
 Cake lac. Bombay.  
 Grain lac. Mirzapore.  
 Seed lac. Mirzapore and Central India.  
 Flake lac. Bengal.  
 Shell lac. Mirzapore. Bengal.  
 Silk lac. Jubbulpore.

Stick lac consists of the resinous incrustation formed by the female lac-insect upon the small branches of various trees and shrubs, being found abundantly throughout most of the forest districts of India and Burmah.

## AGRICULTURAL PRODUCTS.

FOOD GRAINS. CEREALS AND PULSE.—Classes 620 and 621.

Fifteen samples of wheat (*Triticum vulgare*) from Sind, Punjab, Faridpur, Bengal.

Wheat is largely cultivated in the north as a spring crop. Dr. Royle mentions that he has not seen wheat higher than 8,000 feet, but Gerard speaks of it at 10,000, and Capt. Webb at 12,000, on the southern slope of the Himalaya. The extreme limit is given at 13,000 to 15,000 feet. The varieties cultivated in India are not many; white wheats are generally preferred. Bearded wheat is most commonly grown in the Deccan, Gujerat, and Khandeish. Wheat is much grown in the Burmese territories. The natives generally do not consume much of this grain, but it is reserved for sale. Wheat flour is mixed with the flour of some of the pulse, and in this form made into cakes, bread or cakes made of pure wheaten flour being too expensive a luxury for the mass of the population.

Ten samples of barley (*Hordeum distichon*), from Belgaum and other places.

Barley is cultivated in the Himalayas up to 15,000 feet. There are several varieties belonging probably to more than one species, some certainly to *Hordeum hexastichon*. The latter is said by Dr. Stewart to be frequently cultivated as a cold-weather crop in the plains of the Punjab, as it requires less labour and gives more produce than wheat, even in inferior soil and where the water is deep below the surface. In some parts of the Himalayas, above 8,000 feet, it is much more common than wheat, while at lower levels it is less grown. In Lahoul and Ladak it is abundantly cultivated up to 13,000 feet, in the latter some kinds of barley may be seen to over 14,000 feet, about Haule near the Tsomoriri lake. In the plains it is frequently cut two or even three times, when young, as fodder, with little or no injury to the ear, which is formed afterwards. In Lahoul, on the Sutlej, and in Ladak a kind of beer is made from this grain, and in the latter a kind of spirit which is used by some of the richer inhabitants. A dark purple variety of barley is cultivated near the Sutlej, and a clear translucent barley of superior quality called "paighambri." A similar naked barley is grown in Nepal.

Five samples of oats (*Avena sativa*) from Patna and Monghyr.

Oats were introduced some years ago, and are now grown sparingly at Patna and Monghyr, the original stations, and in one or two other localities, but beyond these does not seem to meet with favour, and the cultivation shows no tendency towards expansion. The paleaceous envelopes develop in greater luxuriance than in Europe, to the deterioration of the grain.

Two samples of maize (*Zea mays*) from North-Western India.

Maize introduced into India is now widely distributed, not only in India proper, but in Burmah, and is universally employed for human food. In the Deccan, Colonel Sykes says, that the spikes are seldom allowed to ripen; while the grain is yet soft and milky the spike is taken off. It is fried or parched and eaten with ghee and pepper or sugar; when the Koonbee and his friends cannot consume in this way the produce of a field the grain is allowed to ripen and is ground into flour. Baden Powell observes in his "Punjab Products," that "maize grows everywhere throughout the hills, and appears to flourish just as well in a temperate as in a tropical climate. At 7,000 feet or more, it is the favourite crop of the people, and for six months of the year forms their common staple of food. Although superseded in the valleys by rice, there is always a little plot of maize around the cottage of the peasantry which is reserved for themselves, while the rice is disposed of to wealthier classes. To the uplands maize is an admirably suited crop. It is very hardy, requires little rain, and is rapidly matured. In sixty days from the day of sowing the cobs are fit to eat, but the grain will not keep. Weevils attack it in preference to any other grain, and it is a popular saying that the life of maize is only a year long."

Seven samples of jowaree (*Sorghum vulgare*).

This grain is the most universally cultivated of any grain in the wet crop; it is in fact (in some parts) the principal support of man and beast. It will grow upon most soils, but luxuriates in the black soil (Sykes). There

are several varieties, but principally one with red seeds, and one with white. When grown for fodder it is much more thickly sown than when grown as a grain. As a fodder plant it is highly esteemed. A single plant found growing by itself is described by Sir John Hearsay in the Journal of the Agri. Hort. Soc. of India for 1858 which produced 12,700 seeds. Some botanists recognise at least three species in cultivation, more or less, in India, viz., the present *Sorghum vulgare*, Pers., *Sorghum cernuum*, W., and *Sorghum bicolor*, Mönch, whilst others regard these as mere varieties of the one species which is extensively cultivated over the world, and exhibits, like all largely cultivated plants, a great tendency to variation.

Nine samples of bajra (*Penicillaria spicata*).

The spiked millet is as common in Africa as in Asia, at a distance bearing some resemblance to our indigenous cat's-tail mace, in the form and size of its spikes. Many stems often proceed from the same root, and these are from three to six feet in height. The fruit spike is dense, compact, and thicker than a man's thumb, from six to nine inches in length (twice as long in Africa). The seeds are obovate and compressed, so that they are largest upwards, almost in shape like a small grape stone, pearl coloured, and smooth. Except *Sorghum*, this is the most commonly cultivated grain. Roxburgh says, that "it is sown about the beginning of the rains, viz., the end of June and "beginning of July, and is ripe in September. It is much cultivated over the "higher lands on the coast of Coromandel. The soil it likes is one that is "loose and rich; in such it yields upwards of an hundred fold; the same "ground will yield a second crop of this or some other sort of dry grain "during Oct., Nov., Dec., and Jan."

Colonel Sykes says, that it affects a reddish light gravelly or marly soil, but it is sown at times on the black soil. Under favourable circumstances one seed will produce eight stalks, each stalk furnished with a spike full of seed. Commonly, however, each seed produces only one or two good heads. From a head of ripe bajree, growing by accident in the month of August in a field of kodra, I obtained 2,120 perfect seeds. Supposing, therefore, eight heads to each plant, there would be 16,960 seeds, and the plant will commonly average 8,000 seeds. From a field of bajree, reaping of the 27th September, the plants average four stalks each, each stalk with a spike of 2,175 seeds, or a return of 8,700 for one. One plant had ten stalks and 15 heads of grain.

The stalk is almost useless as fodder when dry, but cattle are sometimes fed with it when green. The seeds are considered rather heating, and are used in cold weather mostly as flour. Although in Africa a kind of beer is said to be made from the malted grain, we have no record of such use being made of it in India.

15 samples of Italian millet (*Setaria Italica*).

This is considered by the natives one of the most delicious of cultivated grains. It is cultivated in many parts of India, and delights in a light elevated tolerably dry soil. The seed-time for the first crop is June-July; and harvest in September. A second crop may be had from the same ground between September and the end of January. Dr. Roxburgh states that it produces about fifty-fold in a favourable season. Dr. Ainslie writes, "This small round "grain is much prized by the native Indians of all descriptions, who make "cakes of it, and also a kind of porridge; for the purposes of pastry it is "little, if at all, inferior to wheat, and when boiled with milk it forms a light "and pleasant meal for invalids. The Brahmins hold it in high estimation, "indeed more than any other grain." In the Punjab, Baden Powell states that "this grain is much used for feeding poultry, &c. It is very little "used as food otherwise; it is nutritious, but is said to be heating, and apt "to produce diarrhoea." This grain is commonly cultivated in the Himalaya, occasionally up to 6,500 feet. At places on the Chenab the leaves are used as a pot herb.

9 samples of millet (*Panicum miliaceum*).

This grain is extensively cultivated in most parts of India. In the Deccan Col. Sykes reports that it is sown in June-July by hand, is sometimes trans-

"planted, requires weeding in August-September, and is reaped in November-December. In crops not weeded the return was only twelve to one, but in good seasons, and well weeded, the return would be eighteen for one. The grain is cut down with the 'yela,' tied up in sheaves, and trodden out by bullocks. The straw is eaten by cattle whilst a little grain remains in it." At Kundalleh, Colonel Sykes intimates that the yield was far greater, being equal to 192 seers for 4 seers of seed, or 48 for 1.

Dr. Stewart reports that it is common in many parts of the Himalaya up to the Indus, being most common from 3,000 up to 8,000 feet (at places on the Chenáb). It is also grown at 10,000-11,000 feet in Ladák. Its grain is considered digestible and nutritious, and in some parts is mostly consumed unground.

10 samples of little millet (*Panicum miliare*).

This millet is by no means extensively cultivated in India. It is known as *Kutki* in the Punjab, but is sparingly grown. In its uses it does not differ from the Italian and Indian millets, but is far less known.

15 samples of Sawa millet (*Oplismenus frumentaceus*).

Dr. Roxburgh says briefly of this plant that he had "only found it in a state of cultivation. It delights in a light, tolerably dry rich soil; the same ground yields two crops, between the first of the rains in June and July, and the end of January. The seed is wholesome and nourishing; it is an article of diet, particularly amongst the lower classes of the natives, and yields about fifty-fold in a good soil. Cattle are fond of it."

In a letter to the Agri. Hort. Soc. of India, Mr. C. B. Taylor strongly recommends this grain as being much cheaper and better than maize. It is "light and easy of digestion, it makes very palatable puddings, which children appear more partial to than those made of rice, to which grain, when boiled, it bears a striking resemblance, both as to taste and in appearance." This grain is much less cultivated than *Panicum miliaceum*.

15 samples of Koda millet (*Paspalum scrobiculatum*).

This is a very common and cheap grain, grown to some extent in most parts of India. Dr. Roxburgh writes of it that it delights in a light dry loose soil, but will grow in a very barren one. It is cultivated in the rainy season. The seed is an article of diet with the Hindoos, particularly with those who inhabit the mountains, and most barren parts of the country, for it is in such countries only where it is cultivated, it being an unprofitable crop, and not sown where others more beneficial will thrive. It is a very common belief that this grain is unwholesome; this was mentioned by Dr. Ainslie, and has since been often repeated. Dr. Gibson says that "a variety of it called Hurreek often induces temporary insanity, and spasms, &c. Large numbers of people may occasionally be seen thus affected." Dr. Stewart writes that in the Bijnour district this grain "is said to produce cholera and vomiting, and I find that some authors mention a similar phenomenon as occasionally occurring in all three presidencies. The native generally hold that with the ordinary koda, and undistinguishable from it, grows a kind they call majna or majni, which produces the above effects, but it has been with greater probability suggested, that these depend on the use of the new grain under certain conditions. These results, however, cannot be common here, as a very intelligent old gentleman of the district informed me that he had never seen a case."

20 samples of raggee (*Eleusine coracana*).

This grain is of great importance to the poor, from its hardness, and from the abundant return it gives. The best method of cultivation is that which is pursued with rice, but it does not require a similar quantity of water, and it is planted on spots which the farmers have not thought is advisable to appropriate to rice. It will grow on almost any soil, but the return will be proportioned to the quality of the soil and to the attention bestowed on the cultivation. (Sykes.)

The seeds are usually ground into flour by the handmill, this being chiefly a bread grain. The straw, though tough, is employed as fodder, and cattle seem to be fond of it, especially horses, which will even prefer it to any other kind of dry forage. In the south this grain is very largely cultivated, and it

extends north, over the Punjab plains to the Himalaya, where it is pretty frequent as far west as the Chenab up to 6,000 and 7,000 feet.

1 sample of buttee (millet).

1 sample of ralee (millet).

Bamboo seed (*Bambusa arundinacea*).

Bamboo grain has considerable resemblance to oats, and is collected in some localities as food by the poorer classes in times when other food grains are scarce and dear. Mr. Blechynden, in a letter published in Agri. Hort. Soc. of India Journal, gives particulars of the service rendered by this grain after failure of the rice crops in Orissa in 1812, when a general famine was apprehended. "The grain obtained from the bamboo was most plentiful and gave sustenance to thousands; indeed, the poorer, and therefore the greater portion of the inhabitants subsisted for some time solely on this food. So great was the natural anxiety that was evinced to obtain the grain, that hundreds of people were on the watch day and night; and cloths were spread under every clump to secure the seeds as they fell from the branches."

5 samples of raggers (*Amaranthus frumentaceus*).

Dr. Wight writes of this species that it is much cultivated on the slopes of the higher hills in several districts of Southern India. In Coimbatore, Salem, and Madura, he had frequently met with large fields of it, often on very steep slopes. In such situations it often grows upwards of six feet high. The seed ground into meal forms the principal food of the wild inhabitants of the hills. Several species of *Amaranthus* are found in the hilly districts of Northern India, where the leaves are eaten as a vegetable, and the seeds as grain. Dr. Jameson mentions two species cultivated at Kullú.

3 samples of buckwheat (*Fagopyrum esculentum*) from the Himalayas.

This food grain, said to have been originally brought from Central Asia, is found sparingly cultivated in the Himalayas. It grows at about 6,000 feet, according to Dr. Stewart, on the Jhelam; 5,000 to 10,000 on the Chenab and Ravi; 8,000 to 9,000 on the Bías; and on the Sutlej it is grown commonly to 11,500; Gerard states that he has seen it at 13,600 feet. Thomson notes it at 13,000 feet in Zanskar; and Cayley mentions it as cultivated to 14,000 feet in Ladak, where Dr. Stewart saw it to over 13,500. In Lahoul, Aitchison says that the leaves are much used as a pot herb in summer, when other greens are not easily got. One or two other species are believed to be cultivated in the same region for the same purposes. Buckwheat is occasionally seen as a cultivated product in the Deccan, the grain being eaten toasted as a fast-day food by the Hindoos.

2 samples of quinoa (*Chenopodium quinoa*) (portion of seed despatched to India for experimental cultivation on the slopes of the Himalayas).

Soojee flour. Madras.

Tapioca flour (*Jatropha manihot*).

Tapioca (2 samples) (*Jatropha manihot*).

Pearl tapioca (*Jatropha manihot*).

Arrowroot (4 samples) (*Maranta arundinacea*).

Arrowroot (*Curcuma angustifolia*).

Imitation sago (*Tacca pinnatifida*).

Rice (*Oryza sativa*). 25 samples. Bengal.

Rice (*Oryza sativa*). 10 samples. Burmah.

Rice (*Oryza sativa*). 5 samples. Central Provinces.

Rice (*Oryza sativa*). 5 samples. North-West Provinces.

Rice (*Oryza sativa*). 10 samples. Madras.

Rice (*Oryza sativa*). 10 samples. Punjab.

Rice (*Oryza sativa*). 5 samples. Sindh.

25 samples. Paddy. Bengal.

20 samples. Paddy. Burmah.

10 samples. Paddy. Madras.

19 samples. Paddy. Bombay.

2 samples. Paddy. Sindh.

4 samples. Paddy. Punjab.

3 samples. Paddy. Cashmir.

2 samples. Paddy. Oudh.

*Oryza sativa*,

of which there are innumerable varieties, is the favourite food grain of the people, but with the exception of Arracan and a few other districts in which it constitutes the chief and almost only article cultivated, its use is confined to the richer classes throughout the country. It grows readily on low lands, which are well irrigated, heat and moisture being the two great essentials for its development. There are three modes of culture :—The first and simplest consists in sowing the seed broadcast in its natural state. In unirrigated land this method is universally followed. In the second, the seed is steeped and then forced under warm grass to germinate. The seed with the tender shoots is then thrown into the soil which has previously been flooded to receive it. This method prevails wherever water is abundant. In the third the crop is raised in a nursery, and when about a month old the young plants are planted out at stated intervals, in a well-flooded field. This system of transplanting involves a great deal of trouble and is only followed in heavy swampy ground where the plough cannot work, although by it the yield of rice is greater than by any of the other methods. These modes of cultivation are followed in the Kangra Valley in which the celebrated “básmati” rice is grown. Another celebrated variety is the “vara” or scented rice, which is grown exclusively on lands irrigated by the river Bara, in the Peshawur Valley. The rice crop is sown in May or June and reaped in October.

Very many varieties of rice are grown in Oude. A heavy soil and plenty of water suits them best. There are five kinds which are considered among the best; “Mihee” and “Bansee” are foremost. The peculiarity in the cultivation of these two kinds is, that they are transplanted and placed about 5 inches apart. And by this method, if the soil is good, they grow to the height of an ordinary-sized man, and produce a much larger quantity than if otherwise treated. The odour and flavour of these two kinds, when cooked, are superior to those of any other kind. They are only used by those who can afford to buy them.

As the labour in cultivating them makes them dearer than the other sorts, the three other varieties which are considered good are the “Bateesa,” the “——,” and the “Phool-Biring.” They are sown broadcast in June, and left so, and they are the kinds mostly used by natives. The first two mentioned, when new, sell for 10 or 12 seers per rupee, and become dearer according as they become older. The other three kinds sell for about 19 seers per rupee, and are dearer if older. Some consider “Phool-Biring” the best, as it swells in boiling, and has an agreeable odour.

15 samples of *Cajan* pea (*Cajanus Indicus*).

There are numerous varieties of this pea, which is most extensively grown in almost all parts of India. It is sown in the fields at the commencement of the rains in June, and is ripe in December. The young and green pods are used as a vegetable. The seed is split to form Dál, and is used in soups; or it is parched, especially the black variety; or it is ground into meal and mixed with wheat flour made into cakes. The leaves and pods, after the seed is removed, are used as fodder. Sir Walter Elliot says that this pulse when split is in great and general esteem, and forms the most generally used article of diet among all classes. It is chiefly eaten mixed with rice, a mess known as “khichri,” vulgo “kedjari.” Roxburgh assigns to it a comparative value in native estimation after *Phaseolus radiatus*, to which he gives the first place, and *Cicer arietinum*, or Chick pea, which he reckons the second. But as far as the general and daily use of the several kinds may be taken as an indication of taste, the *Cajanus*, or Pigeon pea, must be considered as number one.

15 samples of gram (*Cicer arietinum*).

The Chick pea is largely cultivated, and much esteemed in India as an article of diet, and also as food for cattle. There are three distinct varieties according to the colour of the seed; the white seeded, the brown seeded, and the black seeded. The latter appears to be by no means common. The natives use the seeds parched and ground mixed with wheat flour. Split, it constitutes

one of the Dáls. The green grain eaten raw is called Solaneh. The haulm is used as fodder. Colonel Sykes examined a middle-sized plant collected at Gunneehoon, and found upon it 116 fine pods, some containing three, others two, and some one seed, altogether 170 seeds. This pulse does not appear to be much cultivated in the hill tracts of the North. Barnes says a belief is current in the hills that "there is some affinity in the grain field which attracts the lightning, and, after a storm he had certainly observed whole tracts scorched and destroyed as if by fire." Some attempts have been made to grow gram in Britain, but the climate does not seem to be suitable for the perfection of the seeds in ordinary seasons, although ripe seeds have been produced. Fine large-seeded varieties are grown in Spain.

5 samples of pea (*Pisum sativum*).

5 samples of common pea (*Pisum arvense*).

The grey field pea is common in India. In the Deccan, Colonel Sykes states that it is sown in October by the hand and brought to perfection by the dews in January or February.

Peas are used precisely in the same manner as gram, with the exception of their not being given to horses, and not being made into Lashoo (a kind of Dál pudding). The haulm and remains of the pods are considered good fodder for cattle. The Mahrattas distinguish three kinds, the grey seeded, dark seeded, and white seeded. Although it is generally supposed that our common peas originated from a Mediterranean stock, the small grey Himalayan pea of Lawson's "Synopsis" is there cited as the probable origin, as follows:

"Its seeds were sent from the Himalaya under the name of Kullao, and being from a district of Asia which is supposed to have produced many others of our most useful cultivated plants, it is not improbable but that it may be the origin from which all the improved varieties of the pea at present in cultivation have been derived."

Lentils, 5 samples (*Ervum lens*).

This pulse is widely, but not largely cultivated in India, where it is eaten either boiled whole, or split and used as other split pulse are used. In Northern India it is also ground and mixed with flour. The legumes are eaten green as a vegetable.

In Southern India the return in cultivation is reckoned as 30 for one. Dr. Stewart believes that he has seen it growing as high as 5,500 feet on the Chenab, and it is cultivated in parts of Ladak to 11,500 feet.

Chickling vetch, 5 samples (*Lathyrus sativus*).

This Chickling vetch is cultivated in various parts of India where it is used as food, chiefly as Dál. It will be remembered that Duvernoy ascribed such pernicious qualities to this pulse, as causing rigidity of the limbs, delirium, and other dreadful effects to such an extent that the Duke of Wurtemberg, in 1671, prohibited its use by edict, which was confirmed by his successors. In the recent Pharmacopœia of India, attention was called to this plant in a special note, because "the continued use of its seeds as an article of diet is apt, under certain circumstances, to induce paralysis of the lower extremities." In one district in Bengal, nearly 4 per cent. of the population were "sufferers from it."

Wall or Nankin bean, 15 samples (*Lablab vulgaris*).

Of this there are numerous varieties, and it is found both wild and cultivated; chiefly in the southern part of India. The pods are eaten green as a vegetable, the seeds are split for Dál and are eaten by the poorer classes, especially when rice is dear. The remains of the plant are used as a fodder for cattle. Dr. Ainslie remarks that this pulse "constitutes the chief part of the food of Lascars on ship board; and the sepoys, in making long marches, often carry it ready boiled in their knapsacks."

Chowlie, 15 samples (*Dolichos sinensis*).

This is a very variable plant both in flower and seed, the latter being white, red, dun, brown, black, &c., and also varying very much in size. It is at any rate extensively cultivated, and the seeds are used as Dál or ground up and mixed with other grains as flour. The green legumes are eaten as a vegetable.

Horse gram, 20 samples (*Dolichos uniflorus*).

The flat, almost lenticular seeds of this gram are so peculiar that they are easily recognised. The plant is extensively cultivated in Southern India, where it is known as Horse gram, from its forming the staple food of horses and cattle. The poorer classes also employ it as a Dál in their soups, &c. It is rather a free producer, Colonel Sykes having in the Deccan counted 309 seeds from a moderate-sized plant. Roxburgh observes that "in a good soil and favourable year the produce will be sixty-fold." In the Himalaya, Dr. Stewart notes that it is commonly cultivated for its pulse up to 7,000 feet or more. It is a very useful plant, since it will grow in a very meagre soil.

Burbutti, 3 samples (*Dolichos catjang*).

This pulse is grown alike in fields and gardens, and is eaten dry or green. The young pods are esteemed as a vegetable, and the ripe seeds are split as Dál and used in soups and in other ways. As this is a strong climber it yields a considerable return, flowers and legumes being produced successively as the plant continues to grow. It is difficult to make accurate, or even approximate estimates of the relative cultivation of these plants, but it seems to be true that this is not so much cultivated for its pulse as the allied species *Dolichos sinensis*. Whether botanically they are really distinct species, as some doubt, is not important economically, only that the two are so often confounded, and the names applied interchangeably to the seeds in collections sent to Europe, that it is difficult to ascertain localities for each form separately. It is the *Pee-yan* of Pegu.

Horse bean (*Faba vulgaris*).

The common field bean or horse bean of Britain is rare in India, but it seems to have been cultivated in a few localities, especially in the north of India, although not of much repute. Its Hindustani name is *Bakla*, and in the Punjab it is known as *Chastang*, modified in Ladak to *Nakshan*.

Sword bean (*Canavalia gladiata*).

It is the opinion of Sir Walter Elliot that this bean is only the cultivated form of *Canavalia virosa*; the latter is found wild in almost every hedge in India, and the former is only known under cultivation. It is a perennial climber, ascending to the summit of the loftiest trees, and bearing year after year from the end of the rains, through the cold season, an abundant crop. The seeds are large and of different colours; the white-seeded is most esteemed, but there is also a red-seeded and a brown-seeded variety. The unripe pods are used as a vegetable, and the seeds as a pulse.

Gowar, 5 samples (*Cyamopsis psoralioides*).

This pulse is not much cultivated in fields, but is common as a garden vegetable in many parts of India. The green pods are employed as a vegetable in the same manner as "French beans." The seeds are relished by cattle, but do not enter largely into human food. The plant produces its legumes abundantly in succession as it grows, and is so cultivated that the green pods can be obtained all the year round. In the Punjab, Dr. Stewart states that it is occasionally cultivated as a hot-weather crop for its pulse, west to the Ravi at least. The Rohtak Local Committee communicated to the Punjab Exhibition of 1864 the information that the pulse is there "made into Dál, to be used principally for cattle; it is boiled in a pan, and then the grains are rubbed and worked about with the hand till a froth rises on the mass; a little mustard-seed oil is then added; it is given to cattle to fatten them."

Bean, 5 samples (*Phaseolus vulgaris*).

Mutt, 15 samples (*Phaseolus aconitifolius*).

The plant is low and herbaceous, the leaves are so deeply cut as to be almost palmate. It is seldom sown alone, and ripens in November–December. Split, it forms one of the Dáls, and ground into flour is used for bread and cakes by the natives, and sometimes is used mixed with wheat flour. The steeped grain is also given to cattle. The plant after the seeds are removed is used as fodder. Two varieties are cultivated, the white and black, in the higher provinces of India. It is commonly cultivated as a hot-weather crop all over the Punjab plains, but chiefly in the arid parts with light soil.

Green gram, 15 samples (*Phaseolus Roxburghii*).

According to Sir Walter Elliot, "this is perhaps the most esteemed of all the pulses, though not the most extensively grown. It bears a higher price, and is more in request among the better classes, entering largely into many of the more delicate dishes, and cakes, such as the *paparam* or relish cakes, and those baked for religious ceremonies. Mixed with grain it is considered to be strengthening for horses; the straw makes good fodder for cattle."

There are several varieties distinguished by the size and colour of the seeds, and the plant has a wide distribution in India. The grain is split for Dál, or ground into meal. In the hills it is cultivated up to 6,500 feet. There has been, and still is, considerable confusion of this species with *Phaseolus mungo*, and *P. max.*, so that it is difficult to determine in many cases which is really intended, and the native names alike seem to partake of this uncertainty, and therefore give very little help towards the determination of species in the absence of specimens.

Moog or mungo, 10 samples (*Phaseolus mungo*).

"Moog is sown," says Colonel Sykes, "with the first fall of rain in fields by itself; in favourable seasons it attains the height of two feet. It succeeds very well in a stony soil, and is frequently sown on lands at the base of the low hills, and on the table land above, where the soil is not to be seen from the multitude of stones on the surface. In a small field, planted near a well, and occasionally watered, I counted 62 legumes on one plant with from 7 to 14 seeds in each. The average of 10 seeds to a legume would give a return of 620 for one. The remains of the plant and legumes, when the seeds are beaten out, make excellent fodder for cattle. The grain is eaten in various ways. It is boiled whole, and eaten with salt and pepper. It is split, and becomes one of the Dáls. It is parched, ground into flour, and made into balls with sugar and spices, and in this way forms food for travelling. In times of scarcity a bread is made from it. It is also used in porridge or soup. The unripe legumes are eaten as a vegetable."

It is one of the most extensively cultivated of Indian pulse, up to 3,500 feet on the hills, and it is considered nutritious and digestible.

10 frames containing illustrations of food plants of India.

#### TEA. Class 623.

12 samples of orange Pekoe from Bishnath, Assam, Cachar, Dehra-Doon, Punkabaree, Kangra, Kumaon.

12 samples of flowery Pekoe from Cachar, Assam, Kumaon, Kangra, Telwarree.

10 samples of Souchong from Assam, Dehra Doon, Kangra, Kumaon, Telwarree.

6 samples of Pekoe Souchong from Assam and Kumaon.

9 samples of Pekoe from Assam, Bishnath, Kumaon, Telwarree.

Sample of scented Souchong from Kumaon.

2 samples of Souchong and Pekoe ends from Kangra.

Sample of Mixed Black from Kangra.

3 samples of Hyson from Kumaon, Kangra, Telwarree.

3 samples of young Hyson from Kumaon, Telwarree.

Sample of Chulan from Kumaon.

Sample of rose-scented orange Pekoe from Kumaon.

Sample of black Gunpowder from Kumaon.

Sample of Gunpowder from Telwarree.

Sample of Congou from Kumaon.

Sample of Oolong Souchong. Kumaon.

Sample of fine Souchong. Gurhwal.

Sample of broken Pekoe. Sylhet.

Sample of rose Pekoe. Kumaon.

Sample of curious Pekoe. Kumaon.

2 samples of Pouchong. Kumaon.

Sample of Black Tea. Neilgherries.

Sample of Imperial. Telwarree.

Sample of Telwarree mixture. Telwarree.

Sample of tea buds. Silcoorie.

An exhibition of teas from localities other than the well-known ones in China possesses more than ordinary interest. There can be no doubt that tea will be extensively cultivated in India, land spread over a district exceeding 1,000 miles in length being more or less adapted to its growth. The production of tea in Assam has taken very firm root, and is spreading with almost unexampled rapidity. But the cultivation of tea is not confined to Assam; the Government of India having succeeded, through the able agency of Dr. Jameson, in introducing its cultivation into Dhera-Dhoo, Kumaon, Gurhwal, and Kangra. As the result of this, private enterprise—as represented by a number of individuals and several companies—is now engaged in extending its cultivation in the districts in question, the Government still, however, continuing to foster its growth, not with the view to immediate pecuniary profit, but simply to encourage so important an article of commerce. In the Neilgherries also, the introduction of a culture has proved tea success.

Both in Kumaon and Gurhwal, and the Deyrah Dhoo, Government plantations, as well as those of individuals and companies, are to be found. In the year 1861 alone, the Government distributed to private planters throughout Kumaon, Gurhwal, Deyrah-Dhoo, and the Punjab upwards of 130 tons of seed, and 2,400,000 seedlings.

The first trial of the tea plant at Darjeeling was made in 1841, with a few seeds grown in Kumaon from China stock. It was quite successful as to its growth, and the quality was approved of by the Assam tea planter who visited Darjeeling in 1846, and made the first tea here. The original plants are now to be seen. All are of gigantic size; one is a bush 50 feet in circumference and 20 feet high.

Nevertheless 7,000 feet, the elevation of Darjeeling, is too great for profitable planting; the frost kills the seedlings, and there is not a sufficiently rapid succession of leaf in the warm season to make the manufacture pay. At 7,500 feet the plant does not thrive at all. Elevations of 4,500 feet and under that to 2,000, are the best for tea, and from 3,000 to 1,200 feet will probably be found the best for coffee. Tea and coffee plantations at higher elevations than these may eventually come into occasional use to secure high-flavoured produce without reference to profit.

Although experiments continued to be made on the growth of the tea plant, and seed from Assam and Kumaon was distributed gratuitously by Government, it was not till 1856 that the first plantation was started at Kursing, and another near Darjeeling, by Captain Samler, who was also the first to try coffee. The success in both cases has been complete, and others have followed in the same path. Indeed all that is now required is careful and liberal encouragement by the Government, to render these hitherto valueless mountains a rich and productive field for European enterprise, a profitable source of pleasant labour to the Hill tribes, and through these channels a source of strength and stability to our power.

The manufacture of tea in Darjeeling begins in April and ends in October. During the period twenty pickings of leaves are reckoned on. The tea of April, May, and October is the finest. The coffee is cured from October to January.

The number of tea plants per acre varies from 1,860 to 2,700, according as they are placed at 5 or 4 feet apart. The produce of tea per acre looked for from the first year of manufacture to the fourth or fifth, when a plantation is at maturity, cannot be correctly estimated. The produce per plant in the fourth year of age is variously estimated at  $\frac{1}{4}$  to 3 ounces. Captain Massan, in a memorandum of his operations at Tuckvor, states "he got last season " from a few indigenous Assam plants grown at an elevation of 5,000 feet " above the sea one pound of manufactured tea from each tree. The trees " were seven years old." This is an immense return, and not to be reckoned on on a large scale.

Labour is still abundant, and is likely to continue so from the absence of demand in Eastern Nepal, the great source of supply. The plantations give steady employment to about 3,000 persons, with extra hands occasionally. Wages of Coolies 4s. 8d. to 5s. per mensem.

Employment on tea and coffee is preferred to that on roads and buildings. Wages of manufacturing Coolies amount to 8 rupees per mensem; that of European assistants to from 100 to 150 rupees; of managers from 200 to 400, with house, &c.

## COFFEE.

15 samples of coffee from Aden, Bombay, Tinnevely, Paradise Estate, and Chittagong.

Sample of coffee berries from South India.

Sample of plantation coffee from Coorg.

3 samples of pea-berry coffee from Coorg, Tinnevely, and Mysore.

The coffee berry is being extensively cultivated in the highlands of Southern India, and large tracts of country are available for the extension of its growth.

The subjoined remarks on coffee-planting in Mysore are by COLONEL ONSLOW :—

“According to the traditions of the country, the coffee plant was introduced in Mysore by a Mussulman pilgrim, named Baba Booden, who came from Arabia about 200 years ago, and took up his abode as a hermit in the uninhabited hills in the Nuggur Division named after him, and where he established a muth or college, which still exists, endowed by Government. It is said that he brought seven coffee berries from Mocha, which he planted near to his hermitage, about which there are now to be seen some very old coffee trees. However this may be, there is no doubt that the coffee plant has been known in that neighbourhood from time immemorial; but the berry has never come into general use among the people for a beverage. It is only of late years that the coffee trade of these districts has become of any magnitude, or that planting has been carried to any important extent. There is no record of either farther back than the year 1822, when the revenue was under contract. In the year 1837, when the country had been some years under British rule, the Raja's authority having been suspended in 1832-3, the contract system was discontinued, and a duty of one rupee per maund of 28 lbs. was fixed. From that time the production of coffee and duty is duly recorded. In 1843 the duty was reduced to half a rupee per maund on exportation, and in 1849 to a quarter of a rupee. Together with the reduction of duties, regulations for taking up and holding coffee lands were adopted. At the same time prices continued to rise. Native coffee sold in the country has risen from 1 rupee per maund of 28 lbs. to 6 and 8 rupees.

The encouragement thus given to coffee planters has resulted in the great extension of planting, the prosperity of the planters, and an increase of revenue to the state.

Under the contract system the revenue averaged from 1822 to 1832, 4,270 rupees annually, and from 1832 to 1837, 7,472 rupees annually. The yearly average during the next six years under the duty system, the duty being 1 rupee per maund, was 15,238 rupees on that number of maunds. During the next six years, the duty being half a rupee per maund, the average yearly produce rose to 52,236 maunds, giving a revenue of 26,118 rupees yearly. During the next 12 years, that is, up to 1861 inclusive, to which time the accounts are made up, the yearly average of produce rose to 346,083 maunds, and the revenue to 86,524 rupees, the duty having been reduced to a quarter of a rupee per maund. This short statement serves to show the good effect of liberal measures.

More than 30 years ago a few Europeans were engaged in coffee plantings near Chickmoogloor, a few miles from the Bababooden Hills “Bad mountain” were commenced by two enterprising gentlemen. The success of these has induced many more Europeans to plant coffee in Mysore. The consequence is, that the coffee trade of Mysore bids fair to emulate that of Ceylon. It has given also an example to other parts of India, and the plant originally taken from the Bababooden Muth is now extending over tens of thousands of acres in Coorg, the Wynaad district, the Neilgherry Hills, and along the Western Ghauts, North and South.

In Mysore the number of European coffee-planters has within the last 10 years increased to 20 or 30. The number of native planters is estimated between 3,000 and 4,000. The quantity of land planted or taken up cannot be ascertained with any degree of accuracy. The revenue depending upon the quality of the coffee produced, not upon a tax on land, there is no regular correct system of land measurement. This way of taxing is bad; it leads to bad cultivation and smuggling. It is to be hoped that a land tax will be adopted instead, which would have a good moral and fiscal effect. It would

put an end to smuggling, and would be a great inducement to the natives to improve their cultivation, which is now very slovenly. If the tax were on the land they would make more effort to increase the produce of it. The average produce per acre in Mysore is probably not half that of Ceylon.

The coffee districts are confined to the region of the Western Ghats and the Bababooden Hills. Some attempts have been made to cultivate coffee in the open country, but without success; it seems to require forest land and considerable elevation and moisture.

Elevations of 3,000 feet and under that to 1,200 are probably the best for coffee. Plantations at higher elevations than these may occasionally come into use to secure high-flavoured produce without reference to profit. The whole of the coffee district, with here and there an exception of feverish spots, possesses a climate in which the European can live and work with comfort, and, with moderate care and prudence, with health. The presence of the Borer insect, which of late has proved so destructive to the coffee plantations, has been attributed by the natives to *over-clearing* and cultivation. This explanation seems more probable from the fact that the more roughly cleared and less cared-for gardens of the natives are seldom subject to the attacks of these insects, and as it is certain that they do not attack the younger and more sappy wood, the native idea of leaving a few forest trees and stumps for them to feed upon is not so far-fetched a notion as we, in our supposed greater wisdom, may happen to think.

Planting has of late years been carried to such an extent by Europeans and natives in Mysore, that but little available land remains. These mountain and forest wastes have been turned into rich productive gardens. From being the most wild and desolate parts of Mysore, these districts have become very prosperous, and the people have been raised from poverty to comfort, and in many instances to wealth. The natives are benefiting largely by the capital and example of European planters, and are learning the science of planting.

Mysore generally, especially the coffee districts, affords a most promising field for European capital and enterprise."

#### SPICES.

Spices are very extensively employed in the cooking operations of Oriental nations, including many which are scarcely known in that character in the West. This is the case especially with the carminative seeds, such as coriander, carraway, &c., which we are not accustomed to see in company with mustard and pepper, but are associated with them in the Asiatic *cuisine*.

Pepper, white and black; six samples (*Piper nigrum*). Bombay, Travancore, Oudh, Bengal, Penang.

Consists of the dried berries of a climbing plant, which is indigenous to the forests of Malabar and Travancore. The pepper vine is propagated from cuttings or suckers, laid down at the commencement of the monsoon, in a rich and tolerably moist soil. In three years it begins to bear, each plant yielding on an average 1½ lbs. of pepper per annum. The crop is gathered in March and April. The fruit is plucked when not quite ripe, and dried on mats in the sun. White pepper differs from black only in being deprived of the outer skin by a short maceration in pure water, and subsequent gentle rubbing. In North Canara it is most successfully grown *above* the ghats, although it succeeds well below. An acre of land will bear 2,500 plants, and as they require little care, the cost of cultivating and bringing into bearing one acre does not exceed 40 rupees at the most, and as the annual yield when the plants come into bearing is worth upwards of 800 rupees, the investment is a very profitable one.

Long pepper. Bombay.

Red pepper, two samples. Indore and Dehra-Doon.

Mustard, ten samples (*Sinapis sp.*). Berar, Maunbhoom, Sarun, Chittagong, Oudh, N. W. Provinces, Punjab, Sind.

The seeds of several species or varieties of *Sinapis* are employed in India. It is scarcely possible to determine the species or varieties from the seeds themselves, hence they are grouped together under the above general heading.

Probably a large proportion may be referred to *Sinapis juncea*. Oil is also expressed from these seeds to a considerable extent, and they appear again under the heading of *Materia Medica*.

Ginger, 5 samples (*Zinziber officinalis*). Oudh, Bengal, Rajshahye, C. India.

The following account of the cultivation of ginger has been received from the Hill States adjoining the Ambalah district. Ginger is principally produced in Mahúr Mássá, Patrâ, Dárrâ, Kothi, Kotahi, Bágál, and Jayál. The best pieces of last year's harvest are selected and placed in the corner of a house in the month Phágan; the heap is then smeared over and covered with cow-dung to keep the roots from drying up in Hár month; when the first rain falls, they plough up the land two or three times; they divide the land off into beds with a little raised edge round each bed, taking care to make openings to let superfluous water run off, for if water stands on the crop, the roots will rot. They then bury little pieces of the roots three inches deep in the soil at intervals of nine inches; they next cover over the field with the leaves of trees, which keeps the soil moist, and over the leaves they spread manure, to a depth of half an inch; when it rains the water impregnated with manure filters readily through the leaves to the roots. Artificial irrigation is not employed while the rain lasts, but from Assuh to Poh it is necessary. In the month Poh the plants are about two feet high; for every one shoot there are eight tubers or parts of the root; these are dug out and buried in another place for a month; then they are taken out, exposed to the sun for a day, and are then fit for use.

In the months of Sawán, Bhadon, and Assúh, three times, the field is weeded. A bégah of land requires eight maunds of ginger to plant it, and yields 32 maunds for a first-rate crop.

Ginger fit for planting again sells at eight to ten seers per rupee; that for use only, at 24 to 32 seers per rupee.

In order to dry ginger into "sonth," the fresh roots are put into a basket which is suspended by a rope, and then two men, one on each side, pull it to and fro between them by a bit of rope attached, and thus shake the roots in the basket; this process is carried on for two hours every day for three days. After this, the roots are dried in the sun for eight days, and again shaken in the basket. The object of the shaking together is to take off the outer scales and skin of the roots. A two days' further drying completes the process, and sonth sells three seers to four seers per rupee.

Turmeric is cultivated in the same manner; when ready it is dug up, steeped in hot water a day and a night, and then dried.

Capsicums. Shahabad.

Chillies. Nepal.

Chillies. Vizagapatam, Chittagong.

Cayenne. Madras.

A large number of species, probably chiefly *Capsicum fastigiatum* and *Capsicum frutescens*, appear under the name of chillies or red pepper. The dried ripe fruit is the part used, and some one or more of the numerous species of *Capsicum* yielding them are cultivated all over India. When powdered, they constitute chilly powder, or cayenne pepper.

Curry powder. Madras.

Turmeric, five samples (*Curcuma longa*). Berar, Bimlipatam, Nagode, Deyra-Doon.

Is the dried rhizome of a similar plant to ginger, which likewise is widely cultivated. The bright yellow powder of these rhizomes forms one of the chief ingredients of the renowned "curry powder," which has such an important place in Indian cookery.

Wild nutmegs and mace, 2 samples. Bombay.

Mace. Malacca.

Tej Pat leaves. Madras.

Cinnamon. Malacca.

Kali Jeera. Faridpur.

Adjwan, 4 samples (*Ptychotis ajowan*). Berar, Oudh, Faridpur, Vizagapatam.

These little aromatic seeds are employed by the natives for medicinal and culinary purposes. They may be purchased in any bazaar in India, and are one of the most common of carminative seeds.

Coriander, 3 samples (*Coriandrum sativum*). Berar, Oudh, Faridpur.

The Coriander plant is cultivated extensively in India for the sake of its seeds, which enter into the composition of curry powder, and are employed in other ways as a spice or condiment, and as a medicine. The green plant is also used as a vegetable, and is exposed for sale in the bazaars during most of the year.

Dill seed, 2 samples (*Anethum sowa*). Faridpur, Dharwar.

Fennel seed, 2 samples (*Feniculum panmorium*). Oudh, Sind.

The fennel seed found in the Indian bazaars is the produce of this species, which is regarded by some as only a variety of *Feniculum vulgare*. Its uses and properties are similar to those of the other umbelliferous seeds, such as Carraway, &c.

Fenugrec, 4 samples (*Trigonella fenungrecum*). Vizagapatam, Faridpur, Sind, Kattywar.

Water-lily stems (*Nelumbium speciosum*). Sind.

#### OIL SEEDS. Class 624.

Linseed. *Linum usitatissimum*. 10 samples from Faridpur, Ahmednuggur, Khandeish, Nagpore, Berar, Central Provinces, Rajshahye, Bengal, and Indore.

Large quantities of linseed are imported into Britain from India. The oil is obtained either by simple expression without the aid of heat, when it is of a pale yellow colour, or by the application of a temperature of not less than 200° Fahr. In the latter case it is of a deep yellow or brownish colour and disagreeable odour. The oil prepared in India is inferior to that of Europe, from the fact that the Indian seeds being mixed with those of mustard, with which they are grown, the dyeing properties of the oil are impaired. Linseed contains one fifth of its weight of mucilage (entirely resident in the testa) and one sixth of its weight of fixed oil.

Teel seed. *Sesamum Indicum*. 10 samples from Bombay, Bengal, Vizagapatam, Dharwar, Berar, Central Provinces, Bombay, Ahmedabad, and Madras.

Three varieties of sesame seed are cultivated in India—the white-seeded (*Suffed-til*), the red or parti-coloured (*Kala-til*), and the black variety (*Tillee*); it is the latter which affords the greater proportion of the Gingelly oil of commerce. At the commencement of 1861, white seed was worth in the London markets 65s.; black and brown, 58s. and 60s. per quarter.

A second sort of sesame oil, sometimes called "rape," is obtained from the red-seeded variety.

Black sesame is sown in March, and ripens in May. Red sesame is not sown till June.

Sesamum seed has of late been exported largely to France, where it is said to be employed for mixing with olive oil.

Curdy seed. *Carthamus tinctorius*. Four samples from Dharwar, Central Provinces, Ahmednuggur, and Faridpur.

These seeds yield by expression an oil which when properly prepared and refined is transparent, and of a light yellow colour. It is used in India for culinary and other purposes. This oil deserves more attention than it has hitherto received in this country; and if once fairly introduced, there is no doubt whatever of its becoming a staple import. It is used in some of the Government workshops as a "drying oil." It is believed to constitute the bulk of the celebrated "Macassar oil." The seed is exported under the name of Curdee or safflower seed. In Oude it is sown in October, either alone or along the edge of wheat crops; both light and heavy soils are adapted to it. It is cultivated in every village, but not extensively. There would be no difficulty in farther cultivating it to any extent. The cost of the seed, which

is called "Barré," is 18½ seers per rupee, and the cost of the oil is from 3 to 4 seers per rupee.

Sunflower seed. *Helianthus annuus*. Khandeish.

Niger seed. *Guizotia oleifera*. Five samples from Dharwar, Ahmednuggur, Bengal, Kolapore, and Tanna.

These seeds of a composite plant are much esteemed as an oil seed, and, as such, enter into European commerce. The plant is commonly cultivated in Mysore and the Deccan. The oil is sweet tasted, and is used for the same purposes as Gingelly oil.

Poppy seed. *Papaver somniferum*. Five samples from Central Provinces Bengal, Central India, Oudh.

The seeds yield by expression about 50 per cent. of a bland and very valuable oil, of a pale golden colour, fluid to within 10° of the freezing point of water. It dries easily, is inodorous, of agreeable flavour, and partially soluble in alcohol. The seed is worth about 6ls. in the English market. By simple exposure to the rays of the sun in shallow vessels the oil is rendered perfectly colourless. It is expressed by means of a heavy circular stone, placed on its edge, made to revolve by a long lever, and the apparatus is worked by draught bullocks.

The seed has no narcotic qualities, but has a sweet taste, and is used, parched, by the lower class of natives as a food; it is also much used by the sweetmeat makers as an addition in their wares.

Mustard. *Sinapis glauca*. Maunbhoom.

Mustard. *Sinapis dichotoma*. Calcutta.

Mustard. *Sinapis dichotoma*. Punjab.

Mustard. *Sinapis sp.* Central India.

Mustard. *Sinapis ramosa*. Dharwar.

Mustard. *Sinapis sp.* Dacca.

Mustard. *Sinapis dichotoma*. Howra.

Mustard. *Sinapis glauca*. Shahabad.

Mustard. *Sinapis glauca*. Sarun.

Mustard. *Sinapis glauca*. Central India.

Several species, or at least distinct varieties, of *Sinapis* are cultivated throughout India for the sake of their oil, which is much esteemed for cookery, for medicine, and for anointing the person.

Ground nuts. *Arachis hypogaea*. Five samples from Ahmednuggur, Khandeish, Berar, and Indore.

The ground nut is extensively cultivated in various parts of India; the kernels yield about 44 per cent. of a clear pale yellow oil, which is largely used as food, and as fuel for lamps. The value of ground-nut kernels in London is about 16l. 10s. per ton, and of the oil 42l. to 43l. per ton. For ordinary purposes it is quite equal to olive oil.

Castor-oil seed. *Ricinus communis minor*. Five samples from Baroda, Bombay, Dharwar, and Bimlipatam.

Castor-oil seed. *Ricinus communis major*. Five samples from Bombay, Central India, Central Provinces, Baroda, and Khandeish.

The castor-oil plant is extensively cultivated all over India. It is sown in June by almost all the villages, not extensively, but principally for their own use. Its cultivation can be extended all over Oude. The oil is extracted by bruising the seed and then boiling it in water; the oil is afterwards skimmed off. This is the only seed out of which the oil is extracted by boiling, as in this case it is found cheaper than the method used for other seeds, which is by pressure.

The cost of the seed is one rupee per maund, and the price of the oil is from two to five seers per rupee, according to the abundance of the crop in the season. The proportion of the oil yielded is about half the weight of the seeds boiled; it is only used for burning.

In Cuttack, the plant is grown all over the province, a good deal in patches of newly cleared land in the jungles of the Tributary States and Sumbulpore.

The oil is extracted in two ways. It is used for burning and culinary purposes, and medicinally also. The local market is now  $11\frac{1}{2}$  peculs of the seeds per rupee. Both the native methods of extracting oil are wasteful and tedious, and therefore expensive. European oil presses and a knowledge of some methods of clarifying the expressed oil seem only to be required to render the oil-seed crops of this extensive division of great value.

The large seeds, *Ricinus communis major*, are employed for lamp oil, and the small seeds of the variety *Ricinus communis minor* yield the medicinal castor oil.

Physic nut. *Jatropha curcas*. Khandeish.

These euphorbiaceous seeds yield a valuable oil, which has for some time been known to a limited extent in the English market.

Croton seed. *Croton tiglium*.  
 Hone seed. *Calophyllum inophyllum*. Madras.  
 Churonjee. *Buchanania latifolia*. Bengal.  
 Mowah seeds. *Bassia latifolia*. Central Provinces.  
 Poonja. *Pongamia glabra*.  
 Cress seed. *Lepidium sativum*. Aden.  
 Radish seed. *Raphanus sativus*. Sindh.  
 Black cumin. *Nigella sativa*. Bengal.  
 Black cumin. *Nigella sativa*. Aden.  
 Amadee. *Hibiscus cannabinus*. Khandeish.  
 Cotton seed. *Gossypium herbaceum*. Berar.  
 Moringhy. *Moringa pterygosperma*. N. India.  
 Kamala seed. *Mallotus Philippinensis*.

#### USEFUL INSECTS.—SILKWORMS. Class 638.

Cases containing specimens of various kinds of silkworms of India; prepared by Mr. F. Moore, Assistant Curator, India Museum; viz.,—

*Bombyx mori* (cocoons and moths). Cashmere.  
*Bombyx Croesus* (cocoons); the Nistry of Bengal.  
*Bombyx fortunatus* (cocoons); the Dasee of Bengal.  
*Bombyx textor* (cocoons); the Boropooloo of Bengal.  
 Cross between Cashmere and Nistry (cocoons). Bengal.  
 Cross between Bengal and French (cocoons) Bengal.  
*Bombyx Huttoni* (worm, cocoon, and moths); the wild silkworm of N.W. Himalayas.  
*Antheraea paphia* (Tusseh silkworm); worm, cocoons, and moths. Bengal.  
*Attacus ricini* (Eria silkworm); worm, cocoons, and moths. Bengal.

#### PEARL SHELLS. Class 645.

Pearl oysters (*Meleagrina margaritifera*). Kurrachee.

Pearl-oyster banks exist off the coast at Kurrachee in Sind, and on the eastern coast off Tinnevely and Tuticorin.

#### ISINGLASS, &c. Class 646.

Edible birds' nests. Junk, Ceylon.

These are collected from the rock caves along parts of the Burmese coast, the Andaman and Nicobar Islands, for exportation to China, where they are considered a great luxury as an article of food. The nest is composed of inspissated mucus from the large salivary glands with which these birds are provided.

Fishmaws. Bombay.

Fishmaws are the swimming bladders or sounds extracted from the fish and dried in the sun. They are numerous prepared on the Malabar coast, and exported to Bombay, from whence large quantities are re-exported, principally to China and the Straits Settlements.

**Shark's fin. Bombay.**

Sharks' fins are largely exported from Bombay and Madras to China, where they are much esteemed, being used for the making of soups. From 7,000 to 10,000 cwts. are annually exported there from Bombay.

Glue. Cawnpore. Class 652.

**WAX. Class 654.**

Bees wax. Travancore.  
 Bees wax. Travancore.  
 Bees wax. Pegu.  
 Bees wax. Pegu.  
 Bees wax. Pegu.  
 Bees wax. Rangoon.  
 Bees wax. Singapore (*via* Calcutta).  
 Bees wax (black). Chota Nagpore.

There are several kinds of honey-bees common in India. One species (*Apis sp.*) is kept in a semi-domestic state by the natives along the N.W. Himalayas, and in Kumaon, Kashmir, &c., the bees being hived in the walls of the houses. The hive consists of an earthen pot or other receptacle contained in a small chamber in the wall, and having but a small external opening for the entrance and exit of the bees, but closed internally by a cover, through which the honey is removed after the bees are stupefied by smoke.

The large wild bee (*Apis dorsata*) constructs its nest on the boughs of trees, making a comb about half the size of an ordinary cart-wheel. It is common throughout India.

**TEXTILE SUBSTANCES OF VEGETABLE ORIGIN. Class 665.****COTTON.**

In the following series of cottons, each kind is represented by sample marked *a* in the seed, *b* roller-ginned, *c* saw-ginned, *d* and *e* seed obtained by each method of ginning.

Broach.  
 Broach grown in Dharwar.  
 Dhollerah. Kala kuppas grown at Nagurah.  
 Dhollerah. Poomalia kuppas near Dhollerah.  
 Khandeish.  
 Hingunghaut.  
 Oomrawuttee Bunnie.  
 Oomrawuttee Jerry.  
 Coompta.  
 Westerns.  
 Tinnevely.  
 Sind.  
 Dharwar American.  
 Dharwar American.  
 Dharwar American.  
 Dharwar American, half pressed.  
 Dharwar American, half pressed.  
 Dharwar American, half pressed.  
 Dharwar American, full pressed.  
 Dharwar American, first picking.  
 Dharwar American, 2nd picking.  
 American Upland.

In each of the following series, *a* represents the kuppas, *b* cleaned, *c* seed, *d* yarn, all from the same cotton.

Broach.		Coompta.
Dhollerah.		Westerns.
Khandeish.		Sind.
Hingunghaut.		Dharwar American.
Oomrawuttee.		Pressure experiments.

*Additional Specimens of Indian Cotton.*

Kala bolls from Pahlunpore, Guzerat.  
 Bourbon bolls grown in Sind.  
 Broach bolls grown in Sind.  
 Dhakanioo bolls from Veerungaum.  
 Dhakanioo bolls from Wudwan.  
 Jooria kuppas from Ahmedabad.  
 Lallioo kuppas from Bhownugger.  
 Bunnee kuppas from Boolundshur.  
 Laria kuppas from Palunpoor.  
 Laria (open podded kind) from Ahmedabad.  
 Jooria from Ahmedabad (machine-ginned).  
 Lallioo from Veerungaum (machine-ginned).  
 Kala (cleaned) from Kutch.  
 Broach (churka-ginned) from Sind.  
 Akote (cleaned) from Berar.

## FIBRES. Class 666.

**Flax, 3 samples.** *Linum usitatissimum*. Kangra; Punjab.

Flax is mentioned by Strabo as one of the staples of this part of India. A small quantity of Riga seeds, which had been imported experimentally by Dr. Jameson, Superintendent of the Government Botanical Gardens at Saharanpore, was distributed amongst the peasants, with instructions as to the mode of cultivation; an agent of great practical experience was deputed to examine and report upon the qualifications of different districts for the growth of flax, and a staff of natives were trained by him to act as scouters.

In 1856, two tons of flax produced under his superintendence in the district of Goojranwalla were sent to England, and were sold for 92*l.* 2*s.* 2*d.*, realising a net profit of 47 per cent.

In 1857, 8 cwt. of flax, grown at Juddura, a tract of country in the Kangra district, bordering on the river Beas, were sent home, and were valued at from 55*l.* to 60*l.* a ton.

In consequence of the success of these experiments, an association, called the "Indian Flax Company," sent out an agent to buy up flax produce. He made the district of Sealkote his head-quarters, and as far as could be judged, had every prospect of ultimate success, but, for reasons which it is unnecessary to enumerate here, the enterprise proved a failure.

Rheea stems. *Bœhmeria nivea*.  
 Rheea fibre. *Bœhmeria nivea*. Assam.  
 Puya fibre. *Bœhmeria puoya*. Runipore.  
 Puya fibre. *Bœhmeria puoya*. Assam.  
 Neilgherry nettle. *Urtica heterophylla*. Madras.  
 Yercum fibre. *Calotropis gigantea*. Shahpore.

Prepared as follows:—

The branches are gathered and dried in the sun for from twenty-four to thirty-six hours, when they are taken up, the bark peeled from the woody parts, and the fibres gathered. If placed out in the dew for a night they lose their greenish tint, and become white.

Bendolee Sutta fibre. *Pæderia foetida*. Assam.  
 Jute. *Corchorus olitorius*.  
 Barriala. *Sida rhomboidea*. Bengal.

This fibre is very similar to jute in appearance, but it is considered to be intrinsically so superior that it is worth from 5*l.* to 6*l.* more per ton, and it has accordingly been placed next to that fibre, in order to attract to it the attention which it deserves.

Brown hemp. *Hibiscus cannabinus*. Bombay.

This plant furnishes a portion of the so-called "brown hemp," exported from Bombay. It is readily cultivated, and with more attention to its preparation is calculated to compete with jute.

Every ryot sows a small quantity along the edges of his usual crops for his own use. It is not, but it might be, cultivated extensively all over Oude, and in all kinds of soil. It is sown in the beginning of the rains, and when it commences to flower, it is cut and treated exactly in the same way as "sunn

hemp" from *Crotalaria juncea*. The proportion of fibre is about half the weight of the plant. It is used for making rope, sackcloth, twine, paper, &c. The cost of the prepared fibre is from three to four rupees per maund, according to its strength, length, and cleanliness.

Roselle (cleaned). *Hibiscus sabdariffa*.

Roselle (uncleaned). *Hibiscus sabdariffa*.

Indian mallow. *Abutilon indicum*. Madras.

The plants are gathered and freed of their leaves and twigs, and are put out to dry in the sun for a couple of days. They are then taken up, tied into bundles, and placed under water for about ten days, after which they are taken out, and the fibres are well washed to remove the bark and other foreign matter that may be adhering to them, and are placed in the sun to dry.

Urena lobata. *Crotalaria juncea*. Pegu.

Kangra hemp. *Cannabis sativa*. Kangra.

It grows spontaneously and in abundance everywhere in the submontane tracts, but is cultivated for the fibre only in the eastern portions of the Kangra, and in the Simla Hills. In 1859 an experimental consignment of two tons of Himalayan hemp was valued in the English market at from 30*l.* to 32*l.* per ton, and during the past year another larger consignment of hemp has been despatched at Government expense, by request of the merchants of Dundee. The price at Lahore is about 15*l.* or 16*l.* per ton.

Sunn fibre. *Crotalaria juncea*. Bengal.

Sunn hemp. *Crotalaria juncea*. Berar.

Cultivated near cities by hundreds of beegahs; but in the vicinity of villages only in small quantities, principally for the purpose of making fishing nets. Its cultivation can be extended all over Oude, and principally where a light soil exists. It is sown very thickly at the beginning of the rains, so that it may grow tall and thin. When it begins to flower, it is cut near the root, tied in large bundles, and immersed in water, putting some weight on it (generally mud) to prevent its being carried away. After remaining immersed from four to eight days it is withdrawn from the water, taken by handfuls, beaten on a piece of wood or stone, and washed till quite clean, and the cuticle with the leaves completely removed from the other portion of the plant. Each handful is then piled musket fashion, and left to dry. When perfectly dry, the woody portion, which has been more or less broken, is separated from the fibre by farther beating and shaking. From 3 to 6 maunds of fibre are extracted from each beegah of plant. The fibre is used for making rope, sack-cloth, nets, twine, and paper. The raw material on the field, as plant, costs from two to four rupees per beegah, according to quality; and the prepared fibre costs from four to ten rupees per maund, according to strength, length, and cleanliness of fibre.

Jubbulpore hemp. *Crotalaria tenuifolia*. Jubbulpore.

The cultivation of "hemp" in the district has received considerable impulse of late. Several years ago, Mr. Williams having occasion to send to Calcutta samples of wax, oil seeds, and other materials, filled up the box with indigenous hemp to prevent breakage of the bottles. On arrival at Calcutta, the cleanness and brightness of the fibre struck the consignee, who had it immediately examined by one of the proprietors of the patent Ropewalks, who pronounced it equal to the best Russian hemp, and at once sent an order for 400 maunds of it. The trade has since gradually increased, and Mr. Williams now sends about 6,000 maunds of this fibre annually to Calcutta. The plant is regularly cultivated, but the cultivation is limited. About 10 per cent. of the fibre is lost in the process of heckling, and the cost varies according to the several places in the district and seasons of the year. The price of the prepared fibre is from 3*r.* 8*a.* to 4*r.* per maund. The present means of inland transport is by country carts to Mirzapore, which costs 1*r.* 8*a.* per maund, and from thence to Calcutta by boats, at a farther cost of 1*r.* 4*a.* to 1*r.* 8*a.*, which, with other contingencies, such as covering for carts, or guards' hire, duty in native states, and agency charges at Mirzapore, brings up the cost of the material to 7 rupees per maund before it reaches Calcutta. Mirzapore is, at present, the nearest place of export. The great length of time in getting

down bulky produce from Central India, and the enormous expense of transport, have hitherto prevented Mr. Williams sending his hemp to England; but all this will be overcome the moment the railway line from Bombay to Jubbulpore opens, when the hemp can be landed at Liverpool in as many days as it now takes weeks by country carts and native boats to convey it from the station to Calcutta, and there is no doubt that in a very few years hemp, and also flax, will become large articles of export from the Saugor and Nerbudda territories.

Pine apple. *Ananassa sativa*. Malacca.

Pine apple. *Ananassa sativa*. Mangalore.

The leaves are gathered in the same way as the aloe, and are placed on a piece of board and scraped with a blunt knife. The fibres that are loosened are drawn out, the leaves turned over, and from four to six inches of the stem end scraped as before, and as soon as the fibres are loosened by the removal of the pulp in that part of the leaf, the fibres are taken hold of by the fingers and drawn out. These fibres are again laid on the board, and any remaining portion of the pulp gently scraped out with the aid of water, when they are gathered and dried in the sun.

By another mode of treatment, the leaves are laid in the sun so as to dry up a portion of the sap, when, on being taken up and bruised by the hand, the fibres become loosened, and may be taken hold of, and drawn out. But a great loss of fibre results, so that this method cannot be recommended.

*Sansevieria Zeylanica*. Mysore.

Aloe fibre. *Agave Americana*. Madras.

Aloe fibre. *Agave Americana*. Madras.

Great aloe. *Fourcroya gigantea*. Madras.

The leaves, cut close to the stem, are placed on a piece of board, and beaten with a short stout stick. After being thus bruised, the pulpy portions are scraped out with a blunt knife, and the fibres subsequently washed in clean water and dried in the sun.

Adam's needle. *Yucca gloriosa*. Madras.

Plantain. *Musa paradisiaca*. Madras.

These fibres were prepared from the inner foot-stalks of the plantain tree. These were taken of certain length, placed on a piece of board, and the pulpy mass scraped out with a blunt knife. Both sides of the stalks having been thus scraped whilst clean water was poured on to wash away the remains of the pulp, the fibres were dried in the sun.

Manilla hemp. *Musa textilis*.

Screw pine. *Pandanus odoratissimus*.

Screw pine fibre. *Pandanus odoratissimus*. Madras.

Brush fibre. *Cocos nucifera*. Singapore.

Coco-nut fibre. *Cocos nucifera*. Mysore.

Yor or Gomuti. *Arenga saccharifera*.

Kittul. *Caryota urens*. Mysore.

Palmyra. *Borassus flabelliformis*. Madras.

Moonj. *Saccharum moonja*. Punjab.

Grows wild all over Oude, and is planted in hedges. The moonj or fibre is prepared from the vagina of the leaf just when the stem begins to bear flowers; ropes for towing boats on rivers, and twine for bottoms of charpoys (bedsteads), are made from this fibre. If it is not occasionally wetted, and allowed to become too dry, it easily breaks when used. The prepared fibre costs two rupees per maund.

This grass supplies a strong good fibre, which is beginning to attract attention in this country, and is now being exported from Kurachi in Sindh.

Mat grass. *Cyperus textilis*. Madras.

Khus Khus. *Anatherum muricatum*. Bengal.

Gyeegywt Shaw. Akyab.

Shaw Laybway. *Sterculia* species. Pegu.

Mat grass for common matting. Bengal.

Corah grass for matting. Tinnevely.

5 frames containing illustrations of fibre-producing plants of India.

## WOOL. Class 667.

Sheep's wool. Bombay.  
 Sheep's wool. Mysore.  
 Sheep's wool. Ladakh.  
 Sheep's wool. Ladakh.  
 Sheep's wool (pushm). Bokhara, *vid* Punjab.

Sheep's wool is an article whose export is confined almost exclusively to Bombay and Sind. It is principally obtained from the fat-tailed variety of sheep. These abound in the N.W. frontier districts of Peshawur, Kabul, Kandahar, Herat, and other places. Large flocks of sheep are reared also in the Thull and Bar districts of the Punjab, whose shearings are estimated to produce annually about 400 tons of wool. Large quantities of wool are annually brought down the hills from Kunawur, on the backs of sheep, to the fair at Rampur.

In the Kangra district vast flocks are also found, the wool from which is of good quality.

The flocks of Tibet are immensely numerous, and their wool of the finest quality; the cold climate having the usual effect on the fleece of supplying that peculiar quality which is found in the shawl-wool of the Tibet goat.

Goats' wool (white). Umritsur.  
 Goats' wool (hair). Punjab.  
 Goats' wool (pushm). Umritsur.  
 Goats' wool (pushm). Turfan.  
 Goats' wool (pushm). Yarkand.  
 Goats' wool (pushm). Yarkand.  
 Thread of pushm wool (white). Punjab.  
 Thread of pushm wool (dyed). Punjab.

Pushm or shawl-wool, properly so called, is the downy substance growing next the skin and under the thick hair of the goats inhabiting Tibet, and other elevated regions to the north of the Himalayas. It is of three colours, white, drab, and dark grey. It is cut once a year, and if not shorn as the summer advances the animals themselves rub off the wool.

Before 1867 none of the fine Turfan pushm was allowed to pass through the Maharajah of Cashmere's territory into the British provinces. The Amritsar and Ludianah looms were consequently worked chiefly with a fine sheep's wool from Kerman, which, however, by no means comes up in softness and other qualities to the shawl-goat's down. A considerable amount of pushm from Changthan (or Chinese Tibet) always comes down to the Punjab, but this is much inferior to that of Turkistan. Even now, when free importation of shawl-wool is allowed, the cheaper Kerman material still holds its own with the Punjab weavers, hence the greater part of it still goes to Kashmir.

Camels' wool. Bokhara.  
 Camels' wool. Punjab.

Camels' wool is produced in the Bar and Thull or waste tracts of Shahpur, Rohtak, Jhang, and Gugaira. The soft underwool is used for the manufacture of cloth for chogas of a common kind. An immense number of camels are employed by the merchants who carry on that portion of the trade of India with Central Asia which finds its egress and ingress on the borders of Scinde.

## AGRICULTURAL IMPLEMENTS AND VEHICLES. Class 670, 673, and 682.

Plough and yoke. Berar.  
 Churka (native cotton gin). Bengal.  
 Water cart (model). Bombay.  
 Covered cotton cart (model). Bombay.  
 Covered cotton cart (model). Bombay.  
 Cotton cart (model). Bombay.

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**THE**  
**DOMINION OF CANADA.**

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COMMISSION from CANADA to the INTERNATIONAL  
EXHIBITION, PHILADELPHIA, 1876.

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SENATOR LUC LETELLIER DE ST. JUST, Minister of Agriculture,  
President.

*Honorary Commissioners.*

HON. S. C. WOOD, Provincial Treasurer.  
HON. P. A. GARNEAU, Minister of Agriculture.  
HON. P. CARTERET HILL, Provincial Secretary.  
HON. J. J. FRAZER, Provincial Secretary.  
HON. L. C. OWEN, Attorney-General.  
HON. W. J. ARMSTRONG, Minister of Agriculture.  
HON. MR. NOLIN, Minister of Agriculture.

*Executive Commissioners.*

HON. E. G. PENNY, Senator, Montreal.  
HON. R. D. WILMOT, Senator, Saxbury.  
D. MACDOUGALL, Esq., Berlin.  
JOSEPH PERRAULT, Esq., Secretary.

**REPORT of the CANADIAN COMMISSION at the INTERNATIONAL EXHIBITION of PHILADELPHIA, 1876, communicated by His Excellency the Earl of Dufferin, Governor-General of Canada, to the Lord President of the Council.**

To His Excellency the Right Honourable Sir Frederic Temple, Earl of Dufferin, Viscount and Baron Clandeboye of Clandeboye, in the county of Down, in the peerage of the United Kingdom, Baron Dufferin and Clandeboye of Ballyleidy and Killeleagh, in the county of Down, in the peerage of Ireland, and a Baronet, Knight of the Most Illustrious Order of St. Patrick, and a Knight Commander of the Most Honourable Order of the Bath, Governor-General, &c. &c. &c.

Address to His Excellency the Governor-General of Canada from the Canadian Commissioners.

May it please your Excellency,

We, the Canadian Commissioners at the International Exhibition, Philadelphia, 1876, beg leave to report :—

At an early day after the formation of the Canadian Commission for the Centennial International Exhibition at Philadelphia, the character of the report to be made at the conclusion of its labours came up for consideration. An inspection of the reports of the British Commissions at Paris and Vienna showed that these documents were rendered voluminous by disquisitions in separate papers upon the progress of science as applied to the arts, and by comparisons between the progress in this direction made respectively by the leading nations of the civilised world. It was a grave question for the Canadian Commission whether they should attempt to present any essays of that kind as a part of their report, but after mature consideration it was determined that it would be unwise to do so. Several reasons concurred in causing the Commissioners to arrive at this decision. If such a report was to be made it ought to be of a character intrinsically valuable, and likely to reflect honour upon the Dominion throughout the world. But it was obvious, even if they possessed the necessary amount of varied technical knowledge for such a work, that the Commissioners personally would be too much occupied with the practical administration of the charge committed to them to make it possible for them to devote adequate time to investigation and study. It might have been possible to procure assistance competent to deal with some of the subjects embraced in such a report in a manner creditable to the country; but several men of leisure as well as knowledge would be required for the work if it were to have any completeness, and the expense of a competent and sufficient staff engaged for the requisite time on the subject, and that of subsequently printing several volumes as the result of their labours, seemed to be far greater than would be justified by the fund at the disposition of the Commissioners. It was thought possible that upon some special subjects there might be value in technical reports made from a peculiarly Canadian standpoint, but in general it seemed obvious that students of the useful or fine arts would be sure to find a more comprehensive view of the lessons to be learned from the Exhibition in the elaborate productions of the specialists employed by the governments of the great nations of the world, than could be looked for from anything the Canadian Commissioners could hope to produce.

It is for these reasons that the following report is almost confined to an account of the manner in which the Commissioners fulfilled the duties which arose out of their acceptance of office. Any other observations will be of a very general nature.

## REPORT.

Initiative.	When the Government of the United States determined, by way of celebrating the Hundredth Anniversary of their Independence, to hold a great International Exhibition at Philadelphia, it invited all the nations of the world to take part in the festival. Very soon after this invitation had been issued, many gentlemen engaged in the industries of Canada were impressed with the idea that this country should join in the proposed Exhibition. Representations having been made to this effect to the Government of the Dominion, it was determined that Canada should appear in the great assembly of nationalities. In pursuance of this determination, the subject was placed in the hands of the Hon. L. Letellier de St. Just, Minister of Agriculture, and a Commission was appointed, of which that gentleman became the <i>ex officio</i> President. This Commission consisted, in the first instance, of the Honourable Senator Penny, of Montreal; Francis W. Glen, Esq., president of the Joseph Hall Manufacturing Company, of Oshawa; and the Honourable Senator Wilmot, of New Brunswick, these three gentlemen being intended to represent the provinces of Ontario and Quebec and the group of Maritime Provinces. Joseph Perrault, Esq., was named secretary to the Commission.
Formation of Commission.	
Resignations and successions.	Mr. Glen resigned very shortly after his appointment, and the Commission thus lost the advantage of his practical mechanical knowledge, which would doubtless have been very valuable. He was succeeded by David McDougall, Esq., of Berlin, but the Commission afterwards lost the important services of the Honourable Senator Wilmot, a practical agriculturist, by his declining to proceed to Philadelphia.
Consultations as to adequate representation of the Dominion.	Very soon after the organization of the Commission it became a subject of great anxiety to its members to determine the method in which the work before them should be carried out by the collection of an adequate number of specimens of the various products of the Dominion. Canada and some of the other provinces had already made their appearance at several International Exhibitions, but it was felt that the manner in which she should show herself at Philadelphia must be on a much more extended scale than at London, Paris, or Vienna. This was made necessary by the circumstance of the exhibition taking place on the Continent of which Canada forms a part; where, therefore, if she was seen at all, it must be to take rank as an important American power. Moreover, her proximity to the place of exhibition made it obviously necessary that the plan adopted should be a widely comprehensive one, embracing not a few exhibits selected by the Commission itself, but affording fair scope to the ambition of the whole body of the Canadian people. It seemed to be impossible, for pecuniary reasons, to imitate the example of preceding Exhibition Commissions by purchasing any considerable part of the objects to be shown. It would be, on many accounts, unsatisfactory to accept only a small number of chosen articles, and it would be a task too gigantic and invidious for the Commissioners themselves to make selections of objects deemed meritorious enough for national display. Within certain limits it was desirable that every person anxious to exhibit at Philadelphia should find his appropriate place there; but as it was also found necessary that the Commission should provide for the larger part of the expenditure, this condition manifestly demanded an authority by which some scrutiny should be exercised to prevent a large outlay on comparatively insignificant and unworthy articles. The Commission, after mature deliberation, and having first discovered great difficulties in the way of inducing exhibitors to take part in the enterprise unless guaranteed against unknown expense, determined that it would be necessary to assume the whole cost of the conveyance to Philadelphia, the arrangement of, and the care there, and the reconveyance to Canada of all goods destined for the Exhibition. In order to reconcile this very liberal undertaking with the conditions already described, the Commission invited the assistance of the several Provincial Governments, which was at once heartily accorded them, and each of the Provincial Governments obtained from their respective legislatures some pecuniary appropriation for the purpose of aiding in the general design. An Advisory Board, composed of competent gentlemen, was named in each province, under the direction of
Determination to make exhaustive display.	
Question of expenditure and aid to exhibitors.	
Assumption of charges for freight, to and fro; arrangement of and care of exhibits by the Commission.	
Invitation to Provincial Governments, and call for assistance in carrying out scheme. Pecuniary	

one of the members of the Provincial Ministry, who also appointed a secretary. The names of the gentlemen composing these bodies will be found in the Appendix. The chairman of each Advisory Board was also constituted an Honorary Commissioner.

To all these Advisory Boards the Commission committed the task of deciding what articles should be accepted, it being understood that in extraordinary cases only reference should be made to the Commission itself. By this elastic and comprehensive plan it was hoped to obtain extended sympathy throughout the country, and that hope was justified. The method adopted enlisted in the public service official and unofficial gentlemen of great zeal, experience, and local technical knowledge in all parts of the country, and connected with all departments of industry; and this early opportunity is taken of acknowledging how much the success that may be thought to have been attained is due to the liberal support and confidence of the Provincial Governments, and the active and intelligent co-operation of the Advisory Boards. In spite of the offers to exhibitors, believed to be very liberal, already described, considerable difficulty was still experienced in procuring an adequate representation of our products and industries, but this was overcome by the earnest and judicious efforts of these gentlemen.

It may, perhaps, be fitly stated that two things appeared at first to be great obstacles to obtaining the co-operation of the industrial interests of the country, and no doubt did at last prevent many interesting articles from being sent to Philadelphia. One of these was the illiberal tariff of the United States, which made it impossible to hope that any transactions with the citizens of that country could arise from the comparison of goods and prices; the other was the great financial depression so universally felt.

With a view to create emulation and induce exhibitors to offer their goods, it was also resolved by the Commission to give a certain number of Gold, Silver, and Bronze Medals to Canadian exhibitors only, and in order to secure impartiality in the awards it was promised that they should be made by foreign judges.

When the subject was brought before Parliament great interest was manifested by members of both Houses, and a strong wish was expressed that the appearance of Canada, as one of the nations of the civilized world, at Philadelphia, should be worthy of the country and its enterprising people. An item was placed in the estimates and unanimously carried to appropriate a sum of money, which it will be seen has proved amply sufficient to carry out the intentions of Parliament in a manner which the Commissioners venture to hope has been in accord with this patriotic feeling.

In previous exhibitions Canada had gained high reputation for the scientific and complete collection of minerals which she there displayed. The extension of her territory by the addition of other Provinces, some of them rich in mineral deposits, made it extremely desirable that she should maintain this reputation in the United States. For this purpose the Commission early invited the assistance of A. R. C. Selwyn, Esq., of the Geological Survey of the Dominion. A sum of money was also at once set apart for the special expenditure he was expected to incur in procuring new specimens of this kind of public wealth. As many of these were expected to come from the Western Provinces, the intelligent services of this gentleman were also obtained for collecting, at the same time, other natural and economical products of these extensive territories. Mr. Selwyn and his staff exerted themselves with much spirit in carrying out the wishes of the Commission in both particulars.

In the Provinces of British Columbia and Manitoba, sums of money were in each case appropriated by the Commission to be used in such a manner as should seem good to the Advisory Board for procuring interesting illustrations of their respective Provinces.

As soon as the Government of the Dominion had determined to accept the invitation of the Government of the United States, and had for that purpose constituted a Commission, application was made for the space likely to be required in the various buildings which it was intended to erect in Fairmount Park, the place chosen for the Exhibition. This application was one of the earliest which reached the American authorities, and the Commission has reason to believe that its promptitude was regarded as a compliment by those to whom it was addressed. It was acceded to with much cordiality. Large

appropriation  
from Provincial  
Governments.  
Advisory Boards.

Task of selection  
left to Advisory  
Boards.

Good results  
from their  
cooperation.

Obstacles to be  
contended  
against.

Determination to  
offer special  
awards to  
Canadian exhibitors  
in shape  
of Gold, Silver,  
and Bronze  
Medals.

Interest taken  
in Exhibition by  
Parliament demon-  
strated by  
grant in aid.

Arrangements  
for procuring  
representative  
display of  
mineral re-  
sources of the  
Dominion.

Exertions of  
Mr. Selwyn  
and staff.

British Columbia  
and Manitoba,  
action by.

Early application  
for space.

Cordial accept-  
tion by general  
Direction of  
Exhibition.

spaces were devoted to the purposes of the Dominion in all the departments of the Exhibition; and it may be said that Canada obtained an excellent position in each of them.

Organisation at Philadelphia by United States Government and Stockholders.  
Hheads of Departments.

The Exhibition in Philadelphia was placed under the direction of a Board of Commissioners, appointed by the Federal Government, and a Board of Finance, appointed by and representing the stockholders, who supplied a large part of the capital. The Board of Finance was ably presided over by John Welsh, Esq., of Philadelphia, and all other arrangements, including especially those which concerned Foreign exhibitors, were confided to the Commission, under the Presidency of General Hawley, whose chief executive officer was General Goshorn, with the title of Director-General. The ground selected consisted of 236 acres of Fairmount Park, a large space of ground owned by the City and devoted to the recreation of the population.

Site selected.

Buildings and extent.

The buildings properly belonging to the Centennial Commission were scattered around this area, and consisted of the following:—

	Feet (Length).	Feet (Breadth).
The Main Building	1,880	464
Machinery Hall	1,400	360
Agricultural Buildings	826	540
Women's Pavilion	180	180
Carriage Annexe	392	277
Judges' Hall	152	115
Mineral Annexes to the Main Building	500	50
Pomological Hall	200	180
Horticultural Hall	388	193
Memorial Hall	365	210
Art Annexe	360	200
Photographic Gallery	258	107
Mineral Annexe	500	50
Wagon Building	150	120
Dairy Building	120	110
Shoe and Leather Building	392	277
Brewers' Building	272	96
Saw Mill Shed	200	60

Special structures.

Besides these, special buildings were erected, chiefly at the expense of particular interests. Amongst these may be noted the Federal Building, for collections belonging to the Government of the United States and objects illustrative of the equipment of their army and navy, and of the processes employed in their civil departments. This was under the able supervision of Professor Baird.

Special Grants.

Special grants were also made gratuitously to the various States of the Union, and to several nationalities, of sites upon which to erect buildings for their particular purposes. The Commission in this way granted to the Canadian Commission one of these sites in the best part of the grounds.

Arrangements with firms seeking separate displays.

Firms and individuals desirous of making large displays in special buildings were allowed to erect them on payment of various sums. The whole number of buildings of one kind or another within the gates was about one hundred and seventy-five.

Comparative Extent and Cost of previous International Exhibitions.

It may be interesting to compare the space thus occupied with those which were taken up by the buildings in the previous Great Exhibitions of the world, with the cost.

#### ACRES UNDER COVER OF VARIOUS EXHIBITION BUILDINGS.

London	-	-	1851	-	-	20 acres	-	-	\$1,464,000
New York	-	-	1853	-	-	6	"	-	500,000
Paris	-	-	1855	-	-	30	"	-	4,000,000
London	-	-	1862	-	-	24	"	-	2,300,000
Paris	-	-	1867	-	-	41	"	-	4,596,763
Vienna	-	-	1873	-	-	50	"	-	9,850,000
Philadelphia	-	-	1876	-	-	75	"	-	8,500,000

At a short distance from Fairmount Park was a space devoted to the Exhibition of Live Stock, consisting of an area of forty acres, with suitable sheds. Live Stock Show.

The duty imposed upon the Canadian Commission embraced the illustration of all departments of Canadian industry. The Mining, Lumber, Agricultural, and Manufacturing interests, as well as those concerned in the rearing of cattle, were all to be suitably represented. Accordingly, some room was required in almost all of the buildings above enumerated, as well as suitable space upon the ground devoted to the display of cattle. In the Main Building, chiefly devoted to manufactures, the Commission received the allotment of a space of 30,000 square feet, which it may, perhaps, be well to say was exactly equal to that devoted to Spain and Russia together. It occupied the floor between the main avenue and the northern wall in one direction, and two cross avenues of the building in the other, was immediately adjoining the space occupied by Great Britain and Ireland, and faced that of Spain and Russia on the other side of the avenue. The other British Colonies adjoined it on the west side. The Canadian exhibits occupied a space, taking all the buildings into consideration, larger than that devoted to any nationality other than the United States, with the exception of England.

In the Machinery Hall, the area of 5,000 square feet devoted to Canada was immediately in front of one of the main doors of the building, and consequently remarkably conspicuous. She was favoured by a somewhat similar arrangement in the Agricultural Building, her space having been allotted at the corner formed by the two main avenues, close to one of the doors. The area here was 15,000 square feet. She had also appropriate spaces devoted to her in the Women's Pavilion and the Carriage Annexe, a complete room in the annexe to the Art Gallery, two compartments in the Photographic Gallery; about 3,000 feet in the Dairy Building; and 5,000 feet in the Pomological Hall.

Inasmuch as the Commission had undertaken the task not only of transporting, but of caring for the goods committed to their charge, it became necessary for them to provide the requisite number of show cases for that purpose. With this object the Secretary devised a suitable plan for glass cases. It was also necessary that these cases should fulfil certain conditions. They must be sufficiently handsome, not to degrade the general effect; at the same time, as a very large number of them were required, they must be purchased at a reasonable rate. It was also desirable that they should be capable of being used after the Exhibition, without loss. To meet these requirements the cases must be more or less adapted to every class of exhibit, because it was impossible for the Commission to be aware beforehand of the nature and the variety of goods which they might have to display. And again, economy could only be obtained by the whole being made upon the same plan, so as to permit of the manufacturer repeating in their construction the same process a great many times. It is believed that the design prepared for the Commission met, in a large measure, all these requirements. The cases were almost wholly of glass, and thus enabled the interior space to be fully occupied by goods, which could be seen from all sides. In point of utility, capacity, and beauty, they fulfilled, to a large degree, all the essential conditions, and they compared in these respects very favourably with other cases used at the Exhibition, which had been made to meet similar exigencies. The number of the cases of upright pattern was ninety, besides which there were ten counter cases. At the close of the Exhibition they were sent to Ottawa, and are being used by the Government, for the Patent Office and Museum.

Another care of the Commission was, of course, as to the means of transport, and arrangements were at once made with the Grand Trunk and other railroads of the country by which these roads were brought under the general system adopted by the railroads of the United States engaged in conveying goods to the Exhibition. These railroads undertook to convey all goods to and from the Exhibition for a single fare; it being understood, however, that no rebate would be made on account of goods that were sold at Philadelphia, or that for other reasons were not returned to the place of export. This arrangement was regarded as favourable, and has been carried out by the

Task imposed on Canadian Commission.

Requirements of space.

Extent of allotment in Main Building.

Position.

Extent of allotment in Machinery Hall.

Space given in Agricultural Hall.

Women's Pavilion, Carriage Annexe, Art Gallery, Photographic Gallery, Dairy Building, and Pomological Hall.

Question of arrangement of goods.

Show Cases; much consideration required for a uniform plan to combine at once utility, capacity, beauty and economy.

Successful fulfilment of all in selection of cases.

Number.

Subsequent disposal.

Means and rates of transport.

Single fare to and fro, without any rebate.

railway companies with good faith and a manifest desire to facilitate all the operations of the Commission.

Steamship  
"Lady Head"  
placed at dis-  
position of  
Commission.

To expedite the conveyance of such goods as were to be forwarded from the Maritime Provinces, the Hon. Minister of Marine and Fisheries placed at the disposal of the Commission the steamship "Lady Head." This vessel, under the command of Captain George Matson, accordingly carried all but a small portion of the Maritime Province goods to the port of Philadelphia, from whence they were transported by rail to the Exhibition grounds. The Secretary of the Commission arrived at Philadelphia to prepare for the opening, on the 24th day of March. The first cars arrived at that place on the 1st day of April, and the last on the 4th day of May.

Arrival of first  
and last cars.

Total number of  
cars taken up  
by Exhibits from  
Ontario, Quebec,  
the Maritime  
Provinces, and  
British  
Columbia.

Severe strain  
placed on Com-  
mission to secure  
punctuality in  
opening.

The whole number of cars arriving before the opening, which was fixed for the 10th of May, was 150; of these 100 came from Ontario and 30 from Quebec. The goods from the Maritime Provinces, as already stated, were brought by steamship. When unloaded they required cars for their transport, which together with those coming from British Columbia made up the additional 20.

The Commission, on arriving at Philadelphia, found that the task of receiving, unpacking, and assorting the goods committed to their charge before the opening on the 10th May, required no little exertion for its accomplishment. Besides preparing the cases in the Main Building and filling them with goods, it was necessary that every package should be passed by the Custom House authorities, and that after the packing cases had been emptied they should be duly receipted for in order to their storage by what was called the Terminal Agency.

Platforms  
required for  
special exhibits.  
Geological and  
Ontario Educa-  
tional Depart-  
ment.

Direct super-  
vision of Pro-  
fessor Selwyn  
and Dr. May.

Action in  
Machinery Hall,  
and Agricultural  
Building.

Platforms were also required for musical instruments, sewing machines, and some other objects in the main building, and some goods had to be set up in a particular and expensive manner. The Geological Department, and the very striking display of the Ontario Educational Department, provided by the Hon. Adam Crooks, both required much time and labour, but the Commission were relieved from more than the general care of these exhibits by the direct supervision of Professor Selwyn, of the Geological Survey, and Dr. May, of the Educational Department of Ontario.

In the Machinery Hall again, and in the Agricultural Building, machines had to be set up by skilled mechanics, and preparations had to be made to connect them with the shafts or steam pipes by which many of them were to be set in motion. It was also necessary to supplement the shafting and belts provided by the Centennial Commission. Operations were going on at the same time in six buildings, and some of these were at a distance of nearly a mile from the others. This dispersion naturally made the work of supervision much more laborious than it would otherwise have been. However, by the zealous assistance of the superintendents and workmen employed by the Commission, everything was sufficiently advanced by the opening of the Exhibition for that event to come off without discredit to the Canadian Department, and the Commission had the satisfaction of knowing that the work of no other nationality was farther advanced towards completion than that of Canada upon the 10th of May.

Difficulties in the  
way of adequate  
representation  
of Lumber.

The exhibition of lumber was, from the first, matter of much anxiety to the Commission. Gentlemen connected with that highly important interest were generally anxious to exhibit a large quantity, amounting, according to estimate, to three hundred thousand feet. It was thought by them that the lumber interests of the United States would be very largely represented, and that in order to impress the spectator with the extent of our forest resources it would be necessary that we should cover a great area with this description of goods. The charges, however, of transporting such bulky material were so considerable as to induce the Commission to object to this, as they thought, exaggerated proposal. They finally consented to take ten thousand feet of each description of lumber, on condition that they should be allowed to sell it, and to pay freight out of the proceeds. Several firms engaged in the trade furnished considerable quantities of the choicest description of sawn lumber, and the Quebec and New Brunswick Governments expended money liberally in procuring round and square logs, some of very large size. Much interest was excited among visitors by specimens of the Douglas Pine from British

General action  
by Governments  
of Quebec, New  
Brunswick,  
British Co-  
lumbia, and  
coöperation of  
principal firms.

Columbia; four of these had their places in the so-called Log House. The two largest were a section and a plank, both from trees eight feet in diameter. On the arrival of this timber, however, at Philadelphia, the Commissioners ascertained that, as they had warned the gentlemen connected with the lumber interest, no place had been appropriated for the exhibition of sawn lumber in large quantities. Indeed there was no other exhibit of that kind. After much consideration, therefore, they arrived at the conclusion that it would be impossible to show the deals and planks in their hands, except it were in the interior of the building designed for the plot of ground already mentioned, as having been conceded to them by the American Commission. This building was at first intended only for the purpose of showing square and round timber, the interior to be vacant, and to serve, like the various houses erected by the different states, as a place of meeting for visitors from Canada. They felt that it might be considered a breach of the understanding upon which the ground was granted if they used it as the mere site for a pile of lumber, and for some time there appeared to be a strong objection on the part of the Director General to allow them to do so, partly on account of the combustible nature of the material thus to be disposed. The objection was, however, at last overcome, and both square, round, and sawn lumber—the latter, according to invoices, about eighty thousand feet in quantity—were all built up into an edifice, which eventually attracted a great deal of attention, and of which drawings have been published in most of the illustrated papers of the world. For the ingenuity by which this building was contrived and completed, the Commission owes many thanks to J. Larochelle, Esq., of St. Anselme.

The Commissioners are glad to believe that this exhibit was not fruitless in the way of promoting the trade of the country. It is within their knowledge that gentlemen of Toronto and Ottawa have received orders as a consequence of the display in question.

It may be mentioned that at the corner of the Log House the Canadian flag was hoisted upon the tallest flag-staff in the grounds, a spar from New Brunswick, about ninety feet from the ground to the truck.

In placing the heavy pieces of machinery and lumber the Commission received very material assistance from a loan by the British Commission of a traction steam engine from the factory of Aveling & Porter, which was capable of conveying weights of several tons at a time over the ordinary paths between the buildings.

One of the most important and rising branches of Canadian manufacture is that of cheese, of which not less than 35,000,000 lbs. were exported in the last fiscal year. The Commission felt that it was of the greatest importance that a growing interest of this kind should be fairly represented to the world, and that the object of Canada in appearing at the Exhibition could not be better subserved than in promoting the best display of this part of the national products. Accordingly, when it was found impossible to expose dairy products in the Agricultural Hall, it was determined to come to the assistance of the dairymen of the Dominion, who were invited by the dairymen of the United States to join them in the construction of a suitable building. For this purpose the Canadian Commission acquired \$2,000 worth of stock of the Centennial Company, the money being expended as the share of Canada in the cost of the Dairy House. The stock is held by the Commission, and will probably be worth from 20 cents to 90 cents in the dollar, U.S. currency, according to the determination of a pecuniary question between the American Government and the Centennial stockholders. In this building monthly exhibits of butter and cheese took place, from July to October inclusive. The collection of Canadian dairy products, however, was entirely managed by the Ontario Association, through Mr. Caswell, of Ingersoll; the Commission merely provided the necessary funds, and they were relieved from all trouble by this gentleman carrying out their arrangements. There were four car-loads of dairy produce brought to the grounds from the Dominion.

Another and most important branch of Canadian products consisted of various kinds of Horses, Horned Cattle, and other Live Stock. With respect to these the Commission, after much deliberation, felt it necessary to adopt a rule differing from that which they applied to other exhibits, and to throw all risk of loss or damage upon the owners, who were also obliged to provide the

Solution of problem as to means of display.

Novelty and success of scheme.

Good results in a practical point of view.

Tallest flag-staff in grounds from New Brunswick.

Aid by British Commission.

The cheese manufacture.

Coalition of dairymen of United States and the Dominion.  
Erection of Dairy House.  
Canadian section.

Number of car-loads of Dairy Produce.

Horses, Horned Cattle, and other Live Stock.

necessary assistants. This regulation no doubt, to some extent, contracted the number of this class of exhibitors, and the Commission feel that much credit is due to those gentlemen who, notwithstanding the possibility of loss, enabled them to demonstrate conclusively the vast capabilities of Canada for the breeding even of the highest class of stock.

The number of animals exhibited at different times between the months of August and November inclusive were as follows:—

*Horses	-	-	-	-	-	68
Horned cattle	-	-	-	-	-	72
Sheep	-	-	-	-	-	56
Swine	-	-	-	-	-	50
Poultry and pigeons	-	-	-	-	-	300

Number of animals on show.

Number of car-loads.  
Representation of Fruits.

The number of car-loads of these animals was 45.

The fruit growers of the Dominion were well represented by fruit sent to the Exhibition by associations in Ontario, Quebec, and Nova Scotia. The fruit was sent at different times, as it ripened, and on that which came from Ontario the Commission paid freight in a lump-sum. There was probably in all freight for about three cars.

General scope of Report.

It is not the intention of the Commission to make any report involving special technical studies upon the enormous number and great variety of articles of value exhibited throughout the grounds and buildings of the International Exhibition. The reasons for abstaining from doing so have been set forth in the preface; nevertheless it is proper for them to speak generally of what appears to them to be the fair conclusions derived from a comparison between the products of Canada and those of other nationalities which were brought together at Philadelphia.

Gaps in display natural to a young nation.

There are of course a number of branches of human art in which a country so young as ours cannot hope to compete with the older nations of the world. This is especially the case with painting, sculpture, and ornamental industries of various descriptions, embracing jewellery, decorative works in metal, and the finer descriptions of china, glass-ware, and pottery. Comparatively few of these adorned the Canadian department. It may, however, be said that in photography the specimens exhibited by our artists were not inferior to any that graced the building. In painting our display was creditable, and in sculpture, for purposes of house decoration, our department contained what was universally acknowledged as the finest specimen of workmanship in the building, a much admired marble mantel-piece from the manufactory of Mr. Reid, of Montreal. So again we believe we may say that the specimen of panelling, consisting of imitations of various woods and marbles, with medallions, birds, &c., by Mr. A. M. Greig, of Montreal, was not surpassed by the work of any competitor. The prizes taken in the departments representing the Fine Arts were six in number. Here, too, it may be proper to mention the very valuable collection of insects sent from London, Canada West, a collection which for comprehensiveness and scientific arrangement cannot be surpassed, and which was without a rival on the ground.

Admirable photographic display.

Artistic marble mantel-piece, Mr. Reid, Montreal.

Specimens of panelling, Mr. Greig, Montreal.

Strong points in representation.

It was in manufactures of articles of prime necessity that Canada was likely chiefly to excel, and in these she took high rank among the other manufacturing nationalities. In Leather of all descriptions, including the finer classes, in boots and shoes, in Tweeds and knitted goods, and domestic cottons, in stoves, Tools of all kinds, Printed Books, and similar articles, she compared favourably with any other nationality. In Woollens of all kinds shown by her it was acknowledged frankly by competitors from various parts of the world that she took the first place, though, of course, she did not show broadcloths, nor other goods of very finest make. She made no great display of Cottons, but the few goods in this class were very excellent. In the same way it may be affirmed without unduly boasting that her edge tools, amongst which a large case of saws from the works of Mr. Smith, of St. Catharine's, was conspicuous, were second to none in the buildings. They were especially noticed and commented upon by gentlemen of high experience in Great Britain, acting as Centennial judges; as were also the assortment of nails and

Edge Tools, Mr. Smith, of St. Catharine's.

\* *Vide* Report (vol. I., page 335) by Thomas Parrington, Esq., of Helmsley, Yorkshire, on the Canadian horses exhibited.

tacks by Messrs. Pillow, Hersey, & Co., and of iron goods from Messrs. H. R. Ives & Co., both of Montreal. In this connection the Commission also may remark particularly upon the skates shown by the Starr Company of Halifax. Large orders from different parts of the United States were the consequences of this particular exhibit. Several lots of woollen goods, and an exceedingly well made case of boots and shoes, by Mr. Sutherland, of Kingston, as well as a large quantity from a New Brunswick manufacturer (the Sussex Company), were disposed of in Philadelphia, but owing to the high duties it is to be feared that no profit accrued upon these transactions to the manufacturers. The sewing machines from different parts of the Dominion also obtained high praise, and a large number of musical instruments of various kinds proved the successful efforts that are being made by our manufacturers in this important branch of the arts.

Iron goods,  
Messrs. Pillow,  
Hersey, & Co.,  
Messrs. H. R.  
Ives & Co.,  
Montreal.  
Skates, Starr  
Company,  
Halifax.  
Boots and shoes,  
Mr. Sutherland,  
Kingston, the  
Sussex Company,  
New Brunswick.

It is difficult in any comment of this kind to avoid some appearance of invidious selection, but it is intended to point out not such exhibits as were absolutely the best, but those which from special circumstances attracted most attention. We must not pass by the noble display made by the Ontario Department of Education, which excited marked interest among all classes of visitors. It is known to the Commissioners that the representatives of Japan, and of other nations, eagerly procured some of the instruments used in the instruction of the children of Canada. Very much of the importance which the school books and implements assumed in the Canadian Exhibition, was undoubtedly due to the intelligent explanations afforded by the gentlemen of the department who were at Philadelphia, Dr. May and Mr. Hodgins, to whom the Commission are under many obligations for their courteous co-operation.

Ontario Department of Education.

In manufactures and machinery of all kinds, including Books and Educational appliances, Models of vessels, Musical instruments, Railway Plant, &c., the Canadian exhibitors took 170 prizes.

Awards to Canadian exhibitors in manufactures and machinery.  
Geological Department.

The Geological Department in the Main Building was also highly approved, but it, of course, mainly commended itself to persons of scientific tastes and knowledge. The experts who visited it declared it to be one of the most complete and best arranged collections of the kind which the Exhibition could boast of. Among the specimens of minerals having economic value may be noticed especially the wonderful mass of plumbago, and the preparations illustrating its varied application to the arts, shown by the Dominion Plumbago Company. There was a single block of this mineral which weighed more than 2,800 lbs.

Dominion Plumbago Company.

A case of Petroleum and its products, from the manufactory of the Messrs. Waterman, of London, Canada West, was also among the more interesting and beautiful attractions of this part of the Canadian Department, nor must we forget to notice the many specimens of coal, as well from Nova Scotia as from British Columbia and the Saskatchewan. The Gold column, indicating the quantity of that metal mined in British Columbia, was a source of curiosity and some astonishment to many visitors. This column represented a mass of gold of the value of \$37,000,000, obtained within the last 13 years.

Petroleum and products, Messrs. Waterman, London, C.W.  
Coal.  
Gold column, British Columbia.

For the collection and arrangement of the Geological Department, illustrated by an admirable special catalogue, the Commission has again to thank Professor Selwyn and his accomplished assistants, Messrs. Richardson, Bell, and Dawson. Dr. Honeyman, the Provincial geologist of Nova Scotia, was also always ready with valuable aid, rendered more important by his long experience in similar exhibitions. In this department the Canadian exhibitors carried off 28 prizes.

Thanks for aid in collection and arrangement of Geological Department.

In the larger kinds of machinery, and in the various ingenious contrivances for turning it to account in the saving of labour, the American display was evidently superior to that of any other nationality. The proximity of American manufacturers to Philadelphia would be sufficient to account for this superiority, but it is probable, so far as the Commissioners were able to judge, that in versatility and power of adaptation the American machinists would take the first place in the world. In our own machinery department the display was comparatively small, notwithstanding which some of the machine tools exhibited were spoken of by experienced and practical men as being of high value, not only an account of the excellence of their finish and the solidity of

Superiority of American display of machinery to any other.

Mr. Ramsay, of  
Cobourg.

Messrs.  
McKechnie and  
Bertram,  
Dundas, Ont.

Agricultural  
Hall.

Practical proof  
of excellence of  
display.

Possible trade  
between  
Canada and  
Australasia.

Purchase by  
Queensland  
Commissioner.

Exhibition of  
corn and pro-  
ducts.

Generous gift of  
Count Bielsky,  
Russian Com-  
missioner.

Canadian Fruits.

the parts, but for the novelty of their construction and the ingenuity of the contrivances brought to bear in adapting them to their several purposes. To show that our inventors are not deficient in this capacity, it may be noted that Mr. Ramsay, of Cobourg, was enabled to place throughout the great Pennsylvania Railway, as well as in many foreign countries, his valuable invention for facilitating the removal of railway carriages from their trucks, whether for the purpose of changing the gauge of the wheels or for repairs. Messrs. McKechnie and Bertram also exhibited a Radial Drill, which attracted great attention from machinists, and would, no doubt, have been sold in the United States but for the high duties. As it was, they placed a very fine machine tool in New York. It must, however, be acknowledged, that in this department the Canadian display was an inadequate representation of the enormous capital, skill, and energy employed in the construction of machinery in the Dominion.

In the Agricultural Hall, on the contrary, the show of implements attracted close attention and cordial praise from all who examined them. They had to compete with a very numerous and varied collection of implements of the same class from other manufacturers. But, though the implements sent by the United States were in some cases of an excessively high finish, intended merely for show, the Canadian machines, most of them made for actual work, were admitted to be at least equal to any in the building.

The practical proof of their excellence, combined with their cheapness, is to be found in the desire manifested by gentlemen from Australasia to purchase them, and to procure for the inhabitants of their Colonies the opportunity of seeing implements of so much simplicity and utility, and capable of being produced at so reasonable a cost. It is not for the Commission to speculate upon the success of the attempts made to inaugurate a trade between Canada and the Antipodean parts of the Empire, but this much may be said, that but for the opportunity of showing their productions, afforded to our manufacturers at the Exhibition at Philadelphia, there is no reason to believe that any prospect of such a trade would have been opened up. It is, at all events, a matter of good augury that gentlemen acquainted with agricultural life in the Australian Colonies are confident that several of our Canadian agricultural implements will be found suitable and saleable in those distant markets. It is worthy of particular mention that Mr. Angus Mackay, the Commissioner from Queensland, a large agriculturist and a man of great experience, was induced to buy several Canadian implements for the use of his Government, chiefly from Mr. Watson, of Ayr. The Commissioners feel also that this is the place to point out the important services of Mr. R. W. Cameron, of New York, a native Canadian, now established in that city as a merchant. This gentleman largely, we believe, from patriotic motives, by purchase or advances of money upon goods, has enabled a number of our manufacturers of agricultural implements to test the Australian markets.

The exhibit of Grain was exceedingly satisfactory, and the qualities of many specimens were pronounced by good judges to be of the very highest order. Amongst new and very successful attempts at manufactures there were shown in the Agricultural Hall specimens of Maccaroni and Vermicelli, sent by the firms of Spinelli and Catelli, of Montreal, and various preparations of meat and other edibles by the Sherbrooke Meat Company. The Commission received numerous applications from persons desirous of ascertaining where they could procure these goods. The Commissioners were glad, in connexion with this part of their work, to be able to render some assistance to the agent of the Government of Ontario, the Hon. D. Christie, in procuring several specimens of grain which are thought by good authorities likely to become of particular value to the farming interests of the Dominion. All the Foreign Commissions who exhibited grain were kind and liberal in affording specimens of this class of their products, but we ought especially to mention the name of Count Bielsky, the Russian Commissioner, who, at the request of the Canadian Commissioners, presented Mr. Christie with a large quantity of wheat, supposed to be of remarkable merit for our climate. He deserves the greater thanks on this account, because the quantity given was very much greater than can be regarded merely as a specimen.

In fruit the Dominion of Canada occupied a place in the Pomological Hall very much larger than would be her fair share, judging by her geographical

proportions and her population, compared with that of the United States. So far as the Commissioners were able to form a judgment, they believe that, excepting in grapes, in the growth of which California far exceeds any other part of the North American Continent whose products were displayed in the Pomological Hall, she could find nothing to excite her envy. It may be remarked that the Californian grapes are all from European sources, while it is understood that most of those grown on the eastern side of the Rocky Mountains are derived from indigenous vines. The Californian fruits were very much larger than those from the Dominion, or indeed from any other places, but they lost in flavour the advantage which they might be supposed to have in size. A remark something similar applies with truth to one or two Western States, but in general the apples, pears, and plums of Canada were equal in appearance and size to those of the United States, and sometimes superior in flavour.

In dairy products, notwithstanding the high reputation of the American Dairy products. cheese manufacturers, those from Canada established conclusively that they are not one whit behind the best of their Southern competitors in the quality of their products. This is demonstrated by the large number of prizes awarded to them by the Centennial Judges, who were, except one, American citizens, but who honourably discharged their duty without partiality. The Canadian dairymen certainly showed superior energy, it being a remarkable Energy of Canadian dairy-men. fact that there was more Canadian than American Cheese exhibited in the Dairy House. 2,086 packages were exhibited in all, weighing 55½ tons, made up as follows: from the United States 1,012 packages, weighing over 26 tons; from Canada, 1,003 packages, weighing over 29 tons; from other countries, 65 packages, estimated at 500 lbs. One hundred awards were recommended for exhibits of cheese. Of these, forty-five were for the United States, forty-nine for Canada, and the remainder for other countries. In Butter our exhibit was small, reaching only to some 1,700 lbs. out of 1,950 lbs. from all countries; but in proportion to their number, the prizes taken by Canadian butter-makers were very numerous. There were one hundred and twenty-three exhibits from the United States, to which twenty-three prizes were awarded, and sixteen exhibits from Canada, which obtained five prizes.

Wine was an article which, of all those shown at Philadelphia, was perhaps the Wine. most largely exhibited, as to the number of specimens and variety of descriptions, and as to the aggregate of nationalities which sent this kind of merchandise. In this article Canada alone had 10 or 12 varieties, and some of them were pronounced by competent judges to be very respectable as *vins ordinaires*. The Brandy of the Wine Growers' Association of Ontario was especially commended.

Of all departments, however, Canada most excelled in the exhibition of Live Stock. Live Stock. About one-third of all the Horses exhibited came from the Dominion, and out of sixty-eight exhibited by her, fifty-two carried off prizes. A considerable number of these animals were also sold. In Horned Cattle the Canadian animals did not bear so large a proportion to those of the United States as in horses, nevertheless a large number of prizes were taken relatively to the number of animals. The number of exhibits was seventy-two, and the number of prizes was thirty-three.

The proposals of the American Commissioners embraced the offer of The sweepstakes question for Horned Cattle. Sweepstake Prizes for the best Bull and the best Cow on the ground. The Commissioners have little doubt that had those sweepstakes been thus given, the prize for the best bull must have been adjudged to a Canadian, even if Canada had not also carried off that for the best cow, of which there was also some prospect. The Judges, however, declined to make this award, and though the Director-General, upon a remonstrance addressed to him by the Canadian Commissioners, issued an express order to the Judges to determine the sweepstakes, it was afterwards found that they had left the city without doing so.

Sweepstake prizes for the best animals on the ground, were, however, Sweepstake prizes, Swine and Sheep. adjudged to a Canadian Boar, and to two Canadian Long-Wool Sheep. The Canadian sheep were of the long or medium-wool varieties. The American exhibit of this kind consisted of seventy-two sheep; about forty of that number were bred in the United States, and of these few or none were con-

sidered by the Judges as worthy of notice. The rest were recently imported from England. The latter obtained twenty-one awards and a first prize in the Inter-State competition. The position which Canadian stock occupied was so superior that, but for the importation of Mr. Coope, she would have swept everything before her in the breeds which she cultivated.

Total number of sheep exhibited.

The whole number of sheep of these breeds brought under the notice of the Centennial Judges was one hundred and seventy-five. Of these Canada showed fifty-six, consisting of Lincolns, Leicesters, Cotswolds and South Downs. For them she received twenty-four awards, besides the two sweepstakes already mentioned and the Inter-State award for the best flock of six Ewes and one Ram of the long-wool breed. England was represented by forty-seven sheep all from first-class breeds. She took thirty-five prizes, and one sweepstake for the best Ram of any age of the middle-wool breeds.

Swine.

In Swine, the Dominion was well represented; the number of grown animals shown was twenty-seven, some of them accompanied by litters. Twenty-nine prizes were awarded; some of the animals taking more than one prize; the Canadian swine, as already remarked, being also successful in the competition against the world.

Poultry.

No sweepstake prize was given for poultry; but while some breeds of birds from the United States were generally supposed to be superior to those from Canada, in several others it was as generally admitted that Canadian fowls held the first rank. The Commissioners gathered from the judges that the American fanciers excelled chiefly in the larger, and the Canadians in the smaller breeds. But, owing no doubt greatly to the careful choice made for the Canadian exhibits, a very disproportionately large share of the honours fell to their lot. The medal was the same for all awards; but the Judges distinguished three classes of merit in making up their note books, and we are thus able to arrive at the relative excellence of the two displays. Out of one hundred and thirty-three Canadian exhibits, not including pigeons, one hundred and twenty-nine received the highest mark of merit, while the United States exhibitors only had two-hundred and twenty-two highest marks out of four hundred and thirty-four. Fifty-one prizes were obtained for Canadian poultry; but each one was for an exhibit comprising more than one bird.

Good results of Exhibition on Canadians.

Taken throughout, there can be no doubt that the Exhibition at Philadelphia has had the effect of enhancing the feeling of self-respect and patriotism of many thousands of Canadians who visited it, and who saw that, except in some special classes of production, sometimes depending wholly upon the climate or other accidental circumstances, Canadian industries were in no respect behind those so much vaunted in the United States. They had reason, indeed, to believe that while they produced articles of as great excellence, they produced them at lower prices than their rivals, and that nothing prevented a valuable trade in many articles between the two countries, except the excessively high tariff of the United States. At the same time, the Exhibition has afforded proof that the demand for useful articles is not limited to a single nation, and has given cause to hope that, if our products are debarred from a particular market, they may, nevertheless, find a ready sale in other parts of the world.

Hopes of Inter-colonial results.

Nothing can be more encouraging than the manner in which many of our manufactures have been sought for by the Australian colonists, and it is to be hoped that other nations will be found hereafter not insensible to the possibilities of profitable Canadian trade. In many visitors to the Exhibition, not belonging to the British Empire, the display made by Canada excited not only lively interest, but great astonishment. The Commissioners were repeatedly told, as well by the citizens of the United States as by highly intelligent gentlemen from other countries, European and American, that until they saw the variety and perfection of the goods in the Canadian department, they had formed no just idea of the country from which those articles came. They were, of course, aware that the Dominion had a place on the maps of the world, and of North America, but they had no conception that what they had regarded only as a strip of land, remarkable chiefly for ice and snow, could be capable of furnishing domestic animals of the greatest perfection; all the grain used for food in equal plenty and excellence; wine

Wisdom of display as not only evincing natural productive powers, but also manufacturing progress of Dominion.

of a quality by no means despicable, and a variety of manufactures which extend throughout all the articles necessary for the use, if not for the ornament and luxury of life. In this respect, even if no direct pecuniary advantage should arise from the Exhibition, there can be little doubt that its value must be incalculable. Hitherto, when Canada has appeared at an International Exhibition, it has been as the exhibitor of a few articles, which, excepting lumber and cereals, were looked upon as curiosities. For the first time she has met the nations of the world as a nation, and has held her own with all but those of the very first class, giving indications, at the same time, of an ambition, in due course, of taking rank among the latter. The intelligent interest excited in Canada by the Exhibition was manifested by the large number of our fellow-countrymen from all parts of the Dominion who flocked thither. Registers were kept at the office of the Commission, in which Canadian visitors were invited to enter their names. These entries amount in number to 15,000; but as a very large number of persons neglected this formality, it is believed safe to put the Canadian visitors at not less than 30,000.

Register of numbers of Canadian visitors.

Among the visitors from the Dominion were members of the Senate and House of Commons, and of the Provincial Legislatures; several members of the Dominion and Provincial Ministries, and the Premiers of the Dominion, Ontario, Quebec, and Nova Scotia. His Excellency the Governor-General also spent some days in inspecting the most interesting features of the collection, paying especial attention to the various branches of the Canadian Department. He was received with marked respect by the American authorities of the Exhibition, and by Colonel Sandford, the British Commissioner. He did the Canadian Commissioners the honour of residing at their house during his stay in Philadelphia, and, after his departure, was pleased to address a letter to them through the senior member, in which he thus expressed his satisfaction with the Canadian display:—

Visitors.

Governor-General of Canada.

“ Lord Dufferin furthermore desires to express to you the very great satisfaction with which he has witnessed the admirable arrangements under which the Canadian exhibits have been displayed. The whole organisation of the department is most creditable to you and to your colleagues, evincing, as it does, good taste, good judgment, and a thorough appreciation of the manner in which the products and the industries of Canada should be set out to the best advantage. Excellent as were the materials with which you had to deal, their effect has been undoubtedly very much enhanced by the admirable way in which they have been arranged, and I am sure it must have been a great satisfaction to you to have perceived how very much every one has been struck by the Canadian contributions, and the important part taken by the Dominion in the general display. Lord Dufferin also desires that his best congratulations may be conveyed to Mr. McDougall and Monsieur Perrault, to whom he is also anxious that his personal thanks should be conveyed for their kindness and attention to him during his stay.”

Lord Dufferin's letter.

I have, &c.

WM. CAMPBELL.

Highly flattering notices of the Canadian portion of the Exhibition appeared in most of the languages of the civilized world, through articles in the press. It would occupy too much space in this report to quote these complimentary statements, but the following remark by General Hawley may perhaps not be considered out of place here. It was made on the occasion of a public reception of Canadian schoolmasters by the General, as President of the Centennial Commission. He said that “Canada had done more for the success of the Centennial Exhibition than any of the thirty-eight States of the American Union, with the exception of New Jersey and Pennsylvania.”

Flattering notices in press.

The number of Centennial medals taken by Canadian exhibitors was five hundred and sixty-four in all, which shows a large percentage upon Canadian exhibits as compared with the percentage of prizes on the aggregate of the World's exhibits at Philadelphia. Nevertheless, the Commissioners must confess to some astonishment that several valuable articles were apparently overlooked by the

High percentage of Canadian awards.

Judges. They are not at all disposed to impute these omissions to any partiality on the part of those gentlemen. On the contrary, the large number of prizes awarded to our fellow-countrymen indicates that no spirit of jealousy was consciously present. Mistakes and omissions were more or less unavoidable in a task so extensive as that of adjudication on the merits of this vast assemblage of valuable objects; and it may be a reasonable subject of congratulation on the whole that causes of fair complaint were not more numerous. The only case in which the Canadian Commissioners thought they detected anything like unworthy jealousy was in the refusal of the Judges of horned cattle to award the sweepstakes in the manner already described. But if that feeling were present, it was confined to the Judges in that class. The Director-General, on the remonstrance of the Canadian Commissioners, as already mentioned, specially directed that the programme should be carried out, although in fact that was not done. The Commissioners, however, felt it necessary, in the interests of their exhibitors, to send in to the Supplemental Judges appointed to correct omissions, a list of articles which the owners believed would have received prizes had they been properly examined. Of the articles on this list only two finally obtained awards.

Total number of Judges.

The whole number of judges were 250; 140 were American, and 110 foreigners. Those named by the Canadian Commission were as follows:—

H. JOLY, M.P.P., Quebec,  
*Animal and Vegetable products.*  
Hon. Senator SKEAD, Ottawa,  
*Productions of the Forest.*  
E. EMPEY, Esq., Hamilton,  
*Ready-made Clothing and Furs.*  
WM. DUFFUS, Esq., Halifax,  
*Carriages.*  
IRA MORGAN, Esq., Ottawa,  
*Horses.*  
ALEX. BARRY, Esq., Dumfries,  
*Horned Cattle.*  
COL. RHODES, Quebec.  
*Swine.*  
JOHN D. MOORE, Esq., Dumfries,  
*Swine.*  
F. W. FEARMAN, Esq., Hamilton,  
*Cheese, Butter, and Poultry.*

It is proper in this place for the Canadian Commission to give some account of the manner in which their own medals were distributed. This will be best done by the following extracts made from a pamphlet printed for distribution at Philadelphia:

Programme of prizes.

#### PRIZES

#### TO BE GRANTED BY THE CANADIAN COMMISSION.

The Canadian Commission, with the intention of affording inducements to exhibitors at the Exhibition of Philadelphia, offered Gold, Silver, and Bronze Medals as prizes, promising that the awards of such medals should be made by foreign judges.

In pursuance of that engagement, they addressed a letter, of which the following is an extract, to the British Commissioners, Colonel Herbert Bruce Sandford, R.A., and Professor Archer, F.R.S.E.:

“Gentlemen,  
“Canadian Commission,  
Philadelphia, May 23, 1876.  
“The Canadian Commissioners have promised to give to their exhibitors gold, silver, and bronze medals, to be awarded by foreign judges. In order to carry out this design they respectfully ask the aid and co-operation of the British Commissioners, whose nomination of judges, if they will consent to nominate them from English gentlemen here on the business of the Exhibition, will, they believe, be received with complete satisfaction and confidence by all concerned in the awards.

“The Canadian Commissioners, hoping that you will afford them your assistance, submit the following scheme as one which they think may be successfully acted

upon, and they therefore ask your approval or opinion thereon: They propose to subdivide the articles exhibited in the Canadian Section, omitting, for the present, live animals, butter and cheese, new fruits, beers and other fermented and distilled liquors for the table, into several classes, including one for unenumerated articles. They will ask from you the nomination of a judge for each. This judge will be requested to name the persons to whom a definite number of bronze and silver medals shall be awarded. Each judge will be further requested, of the persons to whom he shall have awarded silver medals, to designate any whom he shall think deserving of one of a number of gold medals, limited to five.

"In order to determine who shall receive the gold medals, the judges will be asked, after having made their awards of silver and bronze medals, to select the successful competitors from the candidates for the gold medals, named by the above process; the votes to be delivered in writing on a fixed day to the British Commissioners; and in case of a tie vote for two candidates, one of the British Commissioners, as agreed between themselves, to act as umpire."

"The persons receiving the gold medals will abandon the silver ones; and to prevent delay or other embarrassments in the final determination, it is to be understood that the choice of the successful candidates for the gold medals shall not be rendered invalid by the absence of the votes of any judge or judges, but that the decision shall follow the majority of votes actually cast; and the day for receiving the votes shall be notified to the judges by the Commissioners."

Upon this letter, Colonel Sandford endorsed the following memorandum:

"Copy forwarded to Mr. Trendell, Delegate for judges, who is requested to bring the proposal before the British judges, and ask for the co-operation and assistance of any of these gentlemen who can spare the requisite time."

"The sanction of the Lord President of the Council has been already obtained, by telegraph, to any of the British judges undertaking the duty of awarding prizes in the proposed Canadian competition who may feel inclined to do so."

"If a sufficient number of the British judges will be kind enough to consent to the request of the Canadian Commission, backed as it has been to the British Commissioners by a request from the Governor General of the Dominion of Canada, it will, perhaps, be convenient to call a meeting at St. George's House, when the Commissioners from Canada will be invited to attend."

"(Signed) H. B. SANDFORD."

"St. George's House, May 30, 1876."

On the 5th of June, a meeting was held at St. George's House to consider the request made by the Canadian Commissioners, that the medals to be given by the Dominion to Canadian exhibitors might be awarded by British judges. Meeting at St. George's House.

Col. Sandford presided, and there were present: The Hon. E. G. Penny and Mr. D. Macdougall, Executive Commissioners for Canada, and the following British judges:

Dr. Odling, F.R.S.—*Chemistry and its Applications.*

Mr. J. H. Soden Smith, M.A.—*Ceramics, Pottery, and Glass.*

Mr. Isaac Watts—*Cotton, Yarns, and Woven Goods.*

Mr. Henry Mitchell—*Woollen Goods.*

Major W. H. Noble, R.A.—*Weapons.*

Mr. D. M'Hardy—*Hardware and Edged Tools.*

Sir William Thomson, LL.D., D.C.L.—*Philosophical Apparatus.*

Mr. Charles W. Cope, R.A.—*Sculpture and Painting.*

Mr. Peter Graham—*Industrial Designs.*

Mr. John Anderson, LL.D.—*Metal and Wood Machinery.*

Mr. W. W. Hulse, C.E.—*Spinning and Weaving Machinery.*

Mr. Frederick Paget, C.E.—*Sewing and Clothing Machinery.*

Mr. W. H. Barlow, C.E.—*Motors.*

Capt. Douglas Galton, C.B.—*Railway Plant.*

Col. F. H. Rich, R.E.—*Pneumatic and Water Transportation.*

Mr. John Coleman—*Agricultural Machines.*

Mr. A. J. R. Trendell—*Secretary to British Commission and Official Delegate to the Judges.*

The following resolution, proposed by Dr. Odling, and seconded by Mr. Coleman, was put from the chair and carried unanimously:

"That the British judges here present accept with pleasure the proposal made to them to award special medals to the Canadian exhibitors."

Mr. Penny and Mr. Macdougall expressed the warm thanks of their Commission for the ready response thus given to the request made, and anticipated that all concerned would accept the awards of the British judges with entire satisfaction.

Selection of  
British Judges  
to decide special  
awards.

The following are the classes and number of Silver and Bronze Medals to be awarded therein, with the names of the judges, any of whom will be competent to make the award; or, if they think it necessary, they may invite assistance in their several classes:

1. Machinery of all kinds, excepting agricultural machinery, including all objects in the Machinery Hall; type setting and sewing machines. Three silver and six bronze medals.

*Judges.*—Dr. Anderson, Mr. Hulse, C.E., Mr. Henry Mitchell, Capt. Douglas Galton, Mr. Barlow, C.E., Mr. Paget, C.E.

2. Agricultural machinery and implements, such as ploughs, harrows, &c., of all descriptions, except spades, forks, and similar tools to be used merely by hand. Three silver and six bronze medals.

*Judge.*—Mr. John Coleman.

3. The Fine Arts, including paintings, photographs, and sculpture, whether intended chiefly for decorative purposes or otherwise, and wood carving not on furniture. Two silver and four bronze medals.

*Judges.*—Mr. C. W. Cope, R.A., Mr. Peter Graham, Mr. Soden Smith, M.A.

4. Manufactures from all kinds of metals, including iron safes and all descriptions of tools to be used by hand. Four silver and eight bronze medals.

*Judges.*—Hon. J. Bain, Dr. Anderson, Mr. D. M'Hardy.

5. Wool raw; articles of clothing, and fabrics of all kinds intended to be made up into clothing; blanketing; and furs, raw or dressed, no matter for what purpose. Four silver and eight bronze medals.

*Judges.*—Mr. H. Mitchell, Mr. Isaac Watts, Mr. Hulse, C.E.

6. Leather and its manufactures (all boots and shoes). Three silver and six bronze medals.

*Judge.*—Mr. Hulse, C.E.

7. Musical instruments. Two silver and four bronze medals.

*Judge.*—Sir Charles Reed.

8. Carriages and furniture, including frames for looking-glasses and parquetry work. Two silver and four bronze medals.

*Judges.*—Col. Rich, Mr. Peter Graham.

9. Grain and meal, and manufactures thereof, including macaroni and vermicelli. Three silver and six bronze medals.

*Judges.*—Dr. Odling, Mr. John Coleman.

10. Cured meats, fish, and other preparations of animal food, and glue. One silver and two bronze medals.

*Judges.*—Dr. Odling, Mr. John Coleman.

11. Minerals, including coal, marbles, slates, clays, and plaster, not belonging to either the Dominion or Provincial surveys. Four silver and eight bronze medals.

*Judge.*—Mr. Lowthian, Bell, M.P.

12. Pharmaceutical preparations, soaps, candles, &c., and such as result from distillation, or other chemical process, except beer; liquor, including products of petroleum, together with plant of all kinds. One silver and two bronze medals.

*Judges.*—Dr. Odling, Major Noble.

13. Ladies' Department. Two silver and four bronze medals.

*Judges.*—Col. Rich, Major Noble, Capt. Douglas Galton.

14. Philosophical instruments, and such as are intended for educational purposes or for measuring with precision. One silver and two bronze medals.

*Judges.*—Sir William Thomson, Sir Charles Reed.

15. All articles not included in the above. Four silver and eight bronze medals.

*Judge.*—Mr. Soden Smith, M.A.

The judges in awarding the medals will be governed by considerations of the skill and ingenuity exhibited in the manufacture or production of the articles submitted to them, and to their value and importance in the arts of life.

In case the judges should think proper to increase the number of silver or bronze medals in any class, their recommendation to that effect, and the awards based thereon, will be carried out by the Commission.

British Live  
Stock Judges.

The above applies only to such articles as made a portion of the permanent exhibit throughout the season. But the rest of the Canadian prizes, with

exceptions hereafter mentioned, were awarded in like manner by Centennial Judges from England, named by the British Commission as follows, viz. :—

For Horses, by Thomas Parrington, Esq.

For Horned Cattle, by S. Duckham, Esq.

For Sheep, by Owen C. Richards, Esq.

For Swine, by G. W. Baker, Esq.

All these gentlemen were requested, whenever they might judge it necessary, to associate themselves with experts. It was found impossible to carry out completely the design of taking British judges in every case. For wines, the Commission therefore requested the assistance of M. Rebours, an eminent wine grower of France; and for malt liquors, that of Mr. Massey, a very large brewer of Philadelphia. Both of these gentlemen kindly gave the benefit of their knowledge and experience. In cheese the Commission accepted the nomination of Mr. Fearman, made by the parties interested in that branch of manufacture, and for poultry they named Mr. Halstead, an American judge, who, it was represented, would afford general satisfaction. Judges from other nationalities

Owing to obvious omissions made by some of these gentlemen, such as have already been said to be inseparable from such adjudications, the Commissioners requested Mr. Morris, one of the Commissioners from New South Wales, to act as a supplemental judge on a very few classes of goods, and this gentleman, aided by such experts as he found necessary, awarded a small number of prizes, almost all for manufactured goods. But the Commissioners did not permit these awards to disturb those previously made, and only asked the help of Mr. Morris when they had a moral conviction that articles had been accidentally passed by without examination, or, as in one case, when less than the appointed number of medals had been awarded. It should be noticed that in order to avoid failure on the side of liberality, a special clause in the instructions to the Judges authorized those gentlemen to increase the number of prizes mentioned by the Commissioners for any class whatever, if they should believe that the merits of the articles shown justified such addition. The Commissioners feel that they, and the body of their exhibitors, owe many thanks to these gentlemen for the pains and care with which they executed the charge committed to them, which they accepted with great cheerfulness, and, as the Commissioners believe, carried out with a most conscientious desire to do justice to all parties concerned.

The number of prizes awarded for the Canadian distribution were as follows :—

Gold	-	-	-	-	-	-	13
Silver	-	-	-	-	-	-	174
Bronze	-	-	-	-	-	-	230
Total	-	-	-	-	-	-	417

Number of Special Prizes.

Gold, Silver, and Bronze Medals.

The Commissioners think it proper to explain that the delay in returning the exhibits from Philadelphia was caused by the obstacles thrown in the way of repacking and shipping by the rules of the United States Customs Department. The Exhibition closed on the 10th of November, but it was the 22nd before they were allowed to pack anything; and after they had begun to do so, on permission from the Deputy-Collector, many difficulties occurred at each stage of the process up to the actual re-shipping of the goods. The consequence was, that the Canadian Department was not cleared until the 29th December, by which date everything might have been at home, had these obstructions not occurred. As it was, however, on the 1st January when every Canadian package had left, fully two-thirds\* of the British goods remained, and several of the other foreign countries had not even commenced shipping, so that Canada was the first to close its department in Philadelphia. Besides the annoyance caused by the delay itself, there is reason to believe that several losses of property, by theft, and some damage, occurred during the period between the 10th November and the 29th December, which would not have happened had greater despatch been possible.

Delays in return of goods,—Causes.

Bad effects.

It has been already mentioned that many States of the Union, and foreign nationalities erected houses to serve as meeting places for visitors from these

National and State's Buildings.

St. George's  
House.

Thanks to British  
Commissioners  
and Staff.

Testimonial to  
Mr. A. J. R.  
Trendell from  
Canadian Com-  
missioners.

Thanks to  
members of  
Centennial Com-  
mission and  
Board of  
Finance.

Hospitality of  
Mr. Geo. W.  
Childs and Mr.  
A. Drexel.

Acknowledge-  
ments to  
Exhibitors.

States and countries, and for other purposes, on sites granted them by the Centennial Commission. Among the most beautiful of these was St. George's House, built by the British Commission, and since presented to the City of Philadelphia. In this building the British Commission liberally afforded the Canadian Commissioners two handsome and handsomely furnished apartments, which became of great use to them during the excessively hot weather of summer, and at times when their office in the Main Building was so much frequented by visitors as to make it impossible to carry on any continuous work. For this kindness the Commissioners feel themselves obliged to return their warm thanks to the British Commissioners, who, as well as their staff, afforded them every possible assistance. During the latter part of the Exhibition Colonel Sandford remained alone in charge, and to the last afforded the Canadian Commission every kind of help and encouragement which they needed at his hands. Mr. A. J. R. Trendell, Secretary to the British Commission, and Official Delegate of the Judges, acted as Secretary to the Judges who awarded the Canadian prizes, and it was thought by the Canadian Commissioners that his special services merited an acknowledgment from them. They, therefore, requested his acceptance of a gold chronometer with an appropriate inscription. The desire of the Commissioners to make this gift was formally reported to the Lord President of the Council, and his Grace was pleased to sanction Mr. Trendell's acceptance of the compliment offered him.

The Canadian Commissioners also have to express their thanks to all the gentlemen holding office as members of the American Centennial Commission, and Board of Finance, as well as to the heads of departments and officers acting under them. They would particularly mention (because they had business particularly with them) General Hawley, President of the Commission; General A. T. Goshorn, Director General; John Welsh, Esquire, President of the Board of Finance; General Walker, Chief of the Bureau of Awards; Mr. Albert, Chief of the Machinery Department; Mr. Pettit, Chief of the Bureau of Installation; Captain Torrey, of the Transportation Service, and Colonel Myer Asch, Secretary to the Executive Committee.

They also owe much gratitude for hospitality to many of the citizens of Philadelphia, and for that, as well as for services of a semi-official character with the American Government, to George W. Childs, Esquire, and A. Drexel, Esquire, who were Honorary Members of the British Commission.

Above all, the Commissioners feel that they owe cordial acknowledgements to the exhibitors with whose goods they were charged. It was impossible that a business such as they had to transact could be carried out without some inconvenience, delay, and occasional expense to individuals. They can truly say, however, that these were lessened as much as lay in their power; but they gladly recognize the forbearance and kindness with which they were met almost universally by those gentlemen whom they had occasion to meet on the business of the Commission in Philadelphia. They have reason to hope that their efforts were understood and appreciated, and they feel that in general everything was done by the owners of goods to aid them in the discharge of their frequently onerous duties.

Trusting that the result will be regarded by their fellow countrymen as not unworthy of the national effort which has been made, and that their part of the work may meet with approval, it is but right for them to acknowledge that the praise for the honours which the country has received must belong chiefly to the men who, in various branches of industry, supplied the admirable materials which it was their duty to display.

## APPENDIX.

## CANADIAN COMPETITION.

## MACHINERY.

R. M. Wanzer and Co., Sewing Machines	-	-	-	Gold Medal.
John D. Ronald, Chatham, Ont., Steam Fire Engine	-	-	-	Silver "
McKechnie and Bertram, Dundas, Ont., Engineers' Tools	-	-	-	" "
W. Kennedy and Sons, Owen Sound, Ont., Water Wheel	-	-	-	" "
H. T. Smith, Toronto, Ont., Soda Water Fountain	-	-	-	" "
G. H. Copping, Toronto, Ont., Lozenge Machine	-	-	-	" "
Toronto Car Wheel Company, Car Wheels	-	-	-	" "
John McDougall and Co., Montreal, Car Wheels	-	-	-	" "
W. C. Nunn, Belleville, Ont., Railway Signals	-	-	-	Bronze "
C. W. Williams Manufacturing Co., Montreal, Sewing Machines	-	-	-	" "
Wilkie and Osborn, Guelph, Ont., Sewing Machines	-	-	-	" "
O. St. Amant, Quebec, sewing Machine Attachment	-	-	-	" "
Goldie and McCulloch, Galt, Ont., Water Wheel	-	-	-	" "
Barber and Harris, Meaford, Ont., Water Wheel	-	-	-	" "
F. W. Tuerk, Berlin, Ont., Water Wheel	-	-	-	" "
S. H. Powers, Woodstock, N.B., Self-acting Hand Loom	-	-	-	" "
Toronto Car-Wheel Co., Toronto, Ont., Wheels and Axles	-	-	-	" "
G. S. Tiffany, London, Ont., Combined Brick and Tile Making Machine	-	-	-	" "
Robt. Bustin, St. John, N.B., Fire Escape	-	-	-	" "
Ahearn and Welsh, Ottawa, Bread, Dried Meat, and Vegetable Slicer	-	-	-	" "
J. L. Adams, Montreal, Tobacco Cutter	-	-	-	" "
Waterous Eng. Works Co., Brantford, Ont., Portable Saw Mill	-	-	-	" "
H. Larue, Quebec, Magnetic Separator	-	-	-	" "
K. Freeland, Toronto, Soap Machine	-	-	-	" "
H. W. Cox, Peterborough, Ont., Rotary Force Pump	-	-	-	" "
Wm. English, Peterboro, Hunting Canoe	-	-	-	" "
D. Herald, Gore's Landing, Patent and Plain Hunting Canoes	-	-	-	" "
Wm. Power and Co., Kingston, Models of Ship, Schooner, Centre Board, and Schooner Yacht	-	-	-	" "
Stephen Webster, St. Catharines, Ont., Oil Storing Tank	-	-	-	" "
Brown and Howe, St. John, N.B., Woodturner's Lathe	-	-	-	" "
J. I. Fisher and Co., Kincardine, Ont., Shearing Machines	-	-	-	" "
Elliott's Washing Machine Co., Guelph, Ont., Washing Machine	-	-	-	" "
J. E. Popham, Montreal, Steam Peg Breaker	-	-	-	" "
G. C. Couvrette, Montreal, Ship's Rudder	-	-	-	" "

## AGRICULTURAL MACHINERY.

John Watson, Ayr, Ont., large and excellent display	-	-	-	Gold Medal.
John Abell, Woodbridge, Ont., Portable Engine and Threshing Machine	-	-	-	Silver "
L. D. Sawyer and Co., Hamilton, Ont., Mower and Reaping Machines	-	-	-	" "
Haggert Bros., Brompton, Ont., Horse-Power and Threshing Machine	-	-	-	Bronze "
David Maxwell, Paris, Chaff Cutters	-	-	-	" "
A. Anderson, London, Hand-Power Straw Cutter	-	-	-	" "
Massey Manufacturing Co., Newcastle, Self-acting Horse Rake	-	-	-	" "
J. E. Stong, Newton Brook, Excelsior Self-acting Gate	-	-	-	" "
Acton Plough Co., Acton, General Purpose Plough	-	-	-	" "
Thos. Yeandle, Stratford, Collection of Ploughs	-	-	-	" "
Geo. Wilkinson, Aurora, Collection of Ploughs	-	-	-	" "
P. M. Bawtenheimer, Clifton, Potato Digger	-	-	-	" "
Geo. Ross, Chatham, Ont., Ploughs	-	-	-	" "

## FINE ART.

R. Reid, Montreal, Marble Chimney Piece	-	-	-	Silver Medal.
J. C. Spence, Montreal, Stained Glass Window	-	-	-	" "
Smith and Gemmell, Toronto, Architectural Designs	-	-	-	" "
J. C. Way, Montreal, Oil and Water Colour Paintings	-	-	-	" "
F. Van Luppen, Montreal, Busts	-	-	-	" "
D. Fowler, drawings in Water Colour (flowers and landscapes)	-	-	-	Bronze "
A. Edson, Montreal, Water Colours (landscape)	-	-	-	" "
A. N. Greig, Montreal, Decorative Painting	-	-	-	" "
Langley and Co., Toronto, Architectural Designs	-	-	-	" "

## MANUFACTURES OF METAL.

R. H. Smith and Co., St. Catharine, Ontario, Saws, Hay Knives, Trowels, &c.	-	-	-	Gold Medal.
Pillow, Hersey, and Co., Montreal, Spikes, Nails, Tacks	-	-	-	Silver "
Dates Steel Co., Toronto, Axes, Adzes, Edge Tools, &c.	-	-	-	" "
Spiller Bros., St. John, New Brunswick, an assortment of Tools suitable for coopers, founders, bricklayers, &c.	-	-	-	" "
S. R. Foster and Son, St. John, N.B., Tacks, Nails, Brads	-	-	-	" "
Starr Manufacturing Co., Halifax, N.S., Spikes, Nails, Screw Bolts, &c., also "Acme Club Skates," a variety of styles and excellent workmanship	-	-	-	" "
James Morison, Toronto, Steam Gauges	-	-	-	" "
J. Ritchie and Son, Toronto, Brass Work	-	-	-	" "
G. Gilmore, Montreal, Augurs of good quality and finish	-	-	-	" "
Coldbrook Rolling Mills Company, St. John, N.B., an extensive variety of Cut Nails and Spikes	-	-	-	" "
James Harris, St. John, Marbleized Mantels	-	-	-	" "
James Warnock and Co., Galt, Ont., a variety of Axes and other Edge Tools handled	-	-	-	Bronze "
Peter Robertson, Ottawa, Ontario, lumberman's Tools, and Tools for working in stone and iron	-	-	-	" "
Thomas Moore, Cooksville, Ontario, a large variety of excellent Tool Handles	-	-	-	" "
J. M. Williams and Co., Hamilton, Tinware	-	-	-	" "
Boivin and Co., New Liverpool, Edge Tools	-	-	-	" "
A. S. Whiting Manufacturing Co., Oshawa, Ont., Steel Hay and Manure Forks, Garden Tools, &c.	-	-	-	" "

## WOOLLEN AND COTTON FABRICS, YARNS, FURS, &amp;c.

Rosamond Woollen Co., Almonte, Woollens	-	-	-	Gold Medal.
Thibault, Lander, and Co., Montreal, Furs	-	-	-	" "
Brown and Claggett, Montreal, Dresses	-	-	-	Silver "
Oxford Manufacturing Co., Oxford, N.S., Woollens	-	-	-	" "
Toronto Tweed Co., Toronto, Tweeds, &c.	-	-	-	" "
H. Shorey and Co., Montreal, Clothing	-	-	-	" "
Reynolds and Volkel, Montreal, Furs	-	-	-	" "
Hudson Bay Co., Montreal, Furs	-	-	-	" "
G. R. Renfrew and Co., Quebec, Furs	-	-	-	" "
Mills and Hutchison, Montreal, Tweeds	-	-	-	" "
T. Stavert Fisher, Toronto, Tweeds	-	-	-	" "
John Harvey and Co., Hamilton, Wool	-	-	-	" "
Canada Cotton Manufacturing Co., Cornwall, Domestic, Bags, &c.	-	-	-	" "
Skelton, Tooke, and Co., Montreal, Shirts, &c.	-	-	-	" "
George W. Warner, London, Ont., Furs	-	-	-	Bronze "
John Wardlaw, Galt, woollen Yarns	-	-	-	" "
Adam Lomas and Co., Sherbrooke, Flannels	-	-	-	" "
McCrae and Co., Guelph, Woollen Yarns and Hosiery	-	-	-	" "
Jas. S. May and Co., St. John, N.B., Clothing	-	-	-	" "
John McKenzie and Son, Summerside, P. E. Island, Clothing	-	-	-	" "
R. F. Taylor and Son, Toronto, Clothing	-	-	-	" "
S. F. Willet, Chambly, Flannels	-	-	-	" "
Cantlie, Ewan, and Co., Montreal, Flannels	-	-	-	" "
C. Kaiser and Son, Halifax, N.S., Furs	-	-	-	" "
Dundas Cotton Mills Co., Hamilton, Ont., Cotton Fabrics	-	-	-	" "
W. Parks and Son, St. John, N.B., Cotton Yarns	-	-	-	" "

## LEATHER.

Moseley and Ricker, Montreal, Leather	-	-	-	-	Gold Medal.
King and Brown, Toronto, Fancy Boots, &c.	-	-	-	-	Silver "
R. Malcom, Toronto, Harness and Postal Bags	-	-	-	-	" "
S. R. Wickett, Brooklin, Ont., Leather	-	-	-	-	" "
Slater and Perry, Montreal, Boots and Shoes	-	-	-	-	Bronze "
Sussex Boot and Shoe Co., Sussex, N.B., Boots and Shoes	-	-	-	-	" "
Robert Kelly, Dundas, Ontario, Leather	-	-	-	-	" "
W. Vahey, Forrest, Ont., Block for Horse Collars	-	-	-	-	" "
Wagner and Co., Galt, Ont., Fancy Morocco Leather	-	-	-	-	" "
Galibert and Sons, Montreal, Calf Skins	-	-	-	-	" "
A. Gunn and Co., Kingston, Ont., Leather	-	-	-	-	" "
Dominion Leather Board Co., Montreal, Leather and Jute Board	-	-	-	-	" "
S. and H. Borbridge, Ottawa, Harness and Trunks	-	-	-	-	" "
Lugsdin and Barnett, Toronto, Saddles	-	-	-	-	" "
W. Craig and Son, Port Hope, Ont., Leather Roans and Skins	-	-	-	-	" "
R. Northey, Montreal, Sole Leather	-	-	-	-	" "
Duclos and Payan, St. Hyacinthe, Quebec, Buff Leather	-	-	-	-	" "
J. H. Mooney, Montreal, Fancy Leather	-	-	-	-	" "
McCauland, Upham, and Co., Fredericton, N.B., Enamelled Leather	-	-	-	-	" "
W. H. McCordick, St. Catherine's, Lace Leather	-	-	-	-	" "

## MUSICAL INSTRUMENTS.

Weber and Co., Kingston, Pianos	-	-	-	-	Silver Medal.
W. Bell and Co., Guelph, Cabinet Organ, No. 2	-	-	-	-	" "
Heintzman and Co., Toronto, Pianos	-	-	-	-	Bronze "
Marrin Bros., Parkhill, Organ	-	-	-	-	" "
J. W. Delaware, Toronto, Organs	-	-	-	-	" "
C. Mee and Co., Kingston, Melodeon	-	-	-	-	" "
C. F. Thomas and Co., Hamilton, Piano	-	-	-	-	" "
John Knott and Son, Hamilton, Piano	-	-	-	-	" "
Th. Kater, Hamilton, Piano	-	-	-	-	" "
Rainer and Son, Guelph, Piano	-	-	-	-	" "
New Dominion Organ Co., St. John, Cabinet Organ	-	-	-	-	" "
Gates Bros., Halifax, Organ	-	-	-	-	" "
Brockley and Co., Halifax, Piano	-	-	-	-	" "
E. Draper, London, Harmonic Instructor	-	-	-	-	" "

## CARRIAGES AND FURNITURE.

Daniel Conboy, Uxbridge, for the design and finish of the Sleigh, and the ingenious contrivance for changing the seat of Sleigh	-	-	-	-	Silver Medal.
R. Hay and Co., Toronto, Sideboard	-	-	-	-	" "
B. Ledoux, Montreal, for Double Half Landau, the Double Sleigh	-	-	-	-	" "
John M. De Wolfe, Halifax, N.S., for Pony Carriage, Victoria Phaeton and T Cart	-	-	-	-	Bronze "
William Lee, Toronto, Inlaid Tables	-	-	-	-	" "
J. A. I. Craig, Montreal, Show Cases	-	-	-	-	" "

## AGRICULTURAL PRODUCTS.

J. G. King, Port Hope, Flour	-	-	-	-	Silver Medal.
Martin and Sons, Mount Forest, Oatmeal	-	-	-	-	" "
Samuel Dawes, Whitby, Wheat	-	-	-	-	" "
Advisory Board, Prince Ed. Island, Oats	-	-	-	-	" "
James Parkyn, Montreal, Flour	-	-	-	-	Bronze "
James Wilson, Fergus, Oatmeal	-	-	-	-	" "
Peter McGill, Erie, Wheat	-	-	-	-	" "
Indians, Douglas Lake, Wheat	-	-	-	-	" "
Wm. Rannie, Toronto, Wheat	-	-	-	-	" "
Wm. Bell, Tuckersmith, Wheat	-	-	-	-	" "
Mrs. Jane Taylor, Stanley, N.B., Oats	-	-	-	-	" "
Duck and Pringle, British Columbia, Oats	-	-	-	-	" "
James Smith, Chatham, Oats	-	-	-	-	" "
George Stonehouse, Scarboro, Barley	-	-	-	-	" "
J. S. Stewart, Renfrew, Ont., Rye	-	-	-	-	" "

## PRESERVED MEATS, FRUITS, ETC.

Canadian Meat and Produce Co., Sherbrooke, Canned Meats, &c.	-	-	Silver Medal.
J. D. Bain, Restigouche, N.B., Canned Fish	-	-	Bronze "
Ewing and Wise, B. C., Victoria, Isinglass	-	-	" "
Batelli Bros., Montreal, Macaroni, Vermicelli	-	-	" "
R. Spinelli, Montreal, Macaroni, Vermicelli	-	-	" "

## MINERALS.

Steel Co. of Canada, Londonderry, N.S., Excellent quality of Pig Iron	-	-	Silver Medal.
Dominion of Canada Plumbago Co., Ottawa, Graphite	-	-	" "
Ontario Lithographic Society, Lithographic Stones	-	-	Bronze "
Albert Manufacturing Co., Hillsboro, N.B., Gypsum and Plaster	-	-	" "
James Newton, Colours	-	-	" "
Lake George Mining Co., Prince William, N.B., Autimony and its Ore	-	-	" "
Major Sibley, Ore of Silver	-	-	" "
Canada Peat Co., peat prepared by Hodge's Process	-	-	" "
Rockland Slate Quarry Co., Slates	-	-	" "
Jos. Goodfellow, North Esk, N.B., Grindstones	-	-	" "
P. T. Somerville, Marble Monument	-	-	" "
Robert Forsyth, Montreal, Red Granite Monument	-	-	" "
D. J. McDonald, Cornwall, N.S., Building Stone	-	-	" "
Dorchester Union Freestone Co., Dorchester, N.B., Building Stone	-	-	" "
Daniel and Boyd, St. John, N.B., Building Stone	-	-	" "
Bay of Fundy Red Granite Co., St. George, N.B., Wrought Red Granite	-	-	" "
J. W. Frazer, Halifax, N.S., Coal	-	-	" "
William Hall, Springhill, N.S., Coal	-	-	" "
Union Mining Co., N.S., Coal	-	-	" "
John Sutherland, N.S., Coal	-	-	" "
William Routledge, N.S., Coal	-	-	" "
R. McDonald, N.S., Coal	-	-	" "
R. H. Brown, N.S., Coal	-	-	" "
T. D. Archibald, N.S., Coal	-	-	" "
Henry Mitchell, N.S., Coal	-	-	" "

## CHEMICAL AND PHARMACEUTICAL PREPARATIONS.

Waterman Bros., London, Ont., Petroleum Products	-	-	Gold Medal.
Lyman Bros., Toronto, Pharmaceutical Preparations	-	-	Silver "
Rockville Chemical Co., Chemical Products	-	-	" "
T. Ramsay, Montreal, Paints	-	-	Bronze "
A. W. Hood and Son, Montreal, Soap	-	-	" "

## LADIES' WORK.

Hochelaga Convent, Montreal, one set Priest's Vestments	-	-	Silver Medal.
Miss Helen Hooper, Lace Work	-	-	" "
M. de B. McDonald, Montreal, two pieces of Gobelin Tapestry	-	-	Bronze "
Miss Farrel, Halifax, N.S., Fancy Wool Work	-	-	" "
Lizzie Farquharson, Whitby, Painting on Velvet, Design for Painting	-	-	" "
Convent St. Joseph, Toronto, Berlin Wool Work--Mary Queen of Scots	-	-	" "
The Misses Strickland, Oshawa, Fancy Work	-	-	" "
Convent Jesus Marie, Sillery, Quebec, Fancy Work	-	-	" "
Convent Bon Pasteur, Quebec, Straw Hats	-	-	" "

## EDUCATIONAL AND PHILOSOPHICAL APPARATUS.

Education Department of Ontario	-	-	Gold Medal.
Hearn and Harrison, Montreal, Surveying Instruments	-	-	Silver "
Walker and Miles, Toronto, Atlas of the Dominion	-	-	" "
William Browne, Toronto, Map Stand	-	-	" "
Charles Baillarge, Quebec, Stereometrical Tableau	-	-	" "

## WINES AND MALT LIQUORS.

McLeod and McNaughton, Montreal, Ale	-	-	-	Silver Medal.
John Labatt, London, Ont., Ale	-	-	-	" "
McLeod and McNaughton, Montreal, Porter	-	-	-	" "
Canadian Wine Growers' Association, Ont., Hock	-	-	-	" "
Thomas Davies, Toronto, Ont., Ale	-	-	-	Bronze "
J. W. Labatt, London, Ont., Porter	-	-	-	" "
V. Casci, Toronto, collection of Wines, chiefly for the "Grape Wine" marked No. 6	-	-	-	" "
James Hastings, Whitchurch, Ont., Wine, the growth of 1874	-	-	-	" "

## UNENUMERATED ARTICLES.

Lee Brothers, St. John, N.B., Bricks and Drain Tiles	-	-	-	Silver Medal.
Toronto Fire Extinguishing Co., "Fire-king" fire extinguisher	-	-	-	" "
H. R. Ives and Co., Montreal, Ornamental Wrought-iron Work	-	-	-	" "
A. A. Murphy, Montreal, Pneumatic Fire Extinguisher	-	-	-	" "
G. Chaplean, Montreal, Safe	-	-	-	" "
Dartmouth Rope-walk Co., Halifax, N.S., Ropes	-	-	-	" "
Smith and Kaye, Halifax, N.S., Bricks and Tiles	-	-	-	Bronze "
Ralph Smith and Co., Toronto, Engraving and Lithography	-	-	-	" "
Hamilton and Sons, Surgical Appliances	-	-	-	" "
Ewing and Co., Toronto, Mouldings	-	-	-	" "
John Date, Montreal, Diving Dress (made at a low price)	-	-	-	" "
M. Stanton and Co., Toronto, Room Paper Hangings	-	-	-	" "
Geo. Bishop and Co., Engraved and Coloured Monograms	-	-	-	" "
Elijah Ross, St. John, N.B., Oars	-	-	-	" "
W. G. Rawbone, Toronto, Patent Cartridge Creaser	-	-	-	" "
Geo. Copeland, Hamilton, Ont., Twines, Cords, &c.	-	-	-	" "
G. F. Norvell, Hamilton, Stuffed Birds	-	-	-	" "
T. Egan, Halifax, Taxidermist	-	-	-	" "
M. Foley, Lindsay, Stuffed Birds	-	-	-	" "

## LIVE STOCK DEPARTMENT.

## HORNED CATTLE.

## SHORTHORNS, AGED BULLS.

J. and R. Hunter, Alma, Ont., Lord Aberdeen	-	-	-	Silver Medal.
James Russel, Richmond Hill, High Sheriff	-	-	-	Bronze "
James Gardhouse, Highfield, Count Grindewald	-	-	-	" "
Jacob Terryberry, Glanford, Glanford Prince	-	-	-	" "

## TWO YEARS OLD BULLS.

Thomas Boak, Milton, Ont., Duke of Cumberland	-	-	-	Silver Medal.
J. and R. Hunter, Alma, Ont., Baron Booth, of Killerby	-	-	-	Bronze "

## BULLS UNDER TWO YEARS OLD.

James Russel, Richmond Hill, High Sheriff 2nd	-	-	-	Silver Medal.
J. and R. Hunter, Alma, Ont., Ranger	-	-	-	Bronze "
W. B. Telfer, Ponsonby, Ont., 3rd Duke of Kent	-	-	-	" "

## SHORTHORN COWS.

James Russel, Richmond Hill, Isabella	-	-	-	Gold Medal.
do. do. Duchess of Springbrook	-	-	-	Silver "
W. B. Telfer, Ponsonby, Ont., Maid of Kent	-	-	-	Bronze "
J. and R. Hunter, Alma, Ont., Rose Blossom	-	-	-	" "
W. W. Kitchen, Grimsby, Jessie	-	-	-	" "
do. do. Duchess of Grimsby	-	-	-	" "

## THREE YEARS OLD HEIFERS IN MILK OR IN CALF.

Wm. Miller, Pickering, Ont., Necklace, 7th	-	-	-	Silver Medal.
J. and R. Hunter, Alma, Ont., Maid of Honor 2nd	-	-	-	Bronze "
W. B. Telfer, Ponsonby, Ont., Duchess of Kent	-	-	-	" "

## TWO YEARS OLD HEIFERS.

Wm. Miller, Pickering, Ont., Young Arabella	-	-	-	Silver Medal.
J. and R. Hunter, Alma, Ont., Belle of Sunnyside	-	-	-	Bronze "
Thomas Boak, Milton, Ont., Lady Hubback	-	-	-	" "

## ONE YEAR OLD HEIFERS.

Wm. Miller Pickering, Ont., Rose of Oxford	-	-	-	Silver Medal.
James Russel, Richmond Hill, 3rd Duchess of Springbrook	-	-	-	" "
Hodge and Ketchley, York Mills, Ont., Graceful Lady of Otha	-	-	-	Bronze "
W. B. Telfer, Ponsonby, Ont., Rosedale	-	-	-	" "
do. do. Maid of Kent, 2nd	-	-	-	" "

## HEREFORDS, BULLS UNDER THREE YEARS OLD.

George Hood, Guelph, Ont., Hero	-	-	-	Silver Medal.
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## BULLS UNDER ONE YEAR OLD.

George Hood, Guelph, Ont., Victor 3rd	-	-	-	Silver Medal.
do. do. Robin Hood	-	-	-	Bronze "

## COWS.

George Hood, Guelph, Ont., Victoria	-	-	-	Silver Medal.
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## DEVONS, BULLS.

George Rudd, Guelph, Hartland	-	-	-	Bronze Medal.
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## BULLS UNDER ONE YEAR OLD.

George Rudd, Guelph, Duke of Norfolk	-	-	-	Silver Medal.
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## AYRSHIRES, AGED BULLS.

Wm. Rodden, Plantagenet, Carrick Lad	-	-	-	Silver Medal.
George Thompson, Dwight, Ont., Tarbolton 2nd	-	-	-	Bronze "

## UNDER ONE YEAR.

Wm. Rodden, Plantagenet, General Montgomery	-	-	-	Silver Medal.
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## AYRSHIRE COWS.

Wm. Rodden, Plantagenet, Mermaid, with calf	-	-	-	Gold Medal.
do. do. Lily	-	-	-	Silver "
do. do. Dimple	-	-	-	Bronze "

## ALDERNETS, BULLS.

Wm. Rodden, Plantagenet, Baronet	-	-	-	-	Silver Medal.
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## COWS AND HEIFERS.

Wm. Rodden, Plantagenet, Maggie	-	-	-	-	Silver Medal.
do. do. Pride	-	-	-	-	Bronze "
do. do. Lucy	-	-	-	-	" "

## GALLOWAYS, BULLS.

George Hood, Guelph, Roger	-	-	-	-	Silver Medal.
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## COWS AND HEIFERS.

George Hood, Guelph, Lady Isabella	-	-	-	-	Silver Medal.
do. do. Mary	-	-	-	-	Bronze "

## FAT. CATTLE.

Satchell Bros., Ottawa, Ox Lord Dufferin	-	-	-	Silver Medal.
do. do. Lady Helen	-	-	-	" "

## HERDS.

Messrs. Russell (Shorthorn)	-	-	-	-	Silver Medal.
Messrs. Hunter do.	-	-	-	-	Bronze "
W. Rodden, Ayrshires	-	-	-	-	Silver Medal.
do. Jerseys	-	-	-	-	" "
G. Hood, Galloways	-	-	-	-	" "

## HORSES.

Wm. Clarke, Light Thoroughbred Stallion, Warmanbie	-	-	Gold Medal.
T. and J. Little, Agricultural Stallion, Young Wonder	-	-	" "
John White, Thoroughbred Stallion, Terror	-	-	Silver "
Charles E. Mason, Heavy Draft Stallion, Glenelg	-	-	" "
Wm. Long do. do. Royal Tom	-	-	" "
M. A. Burgess do. do. Honest Sandy	-	-	" "
James and D. Boag, Heavy Draft Mare, Jean	-	-	" "
do. Agricultural Mare, Fancy	-	-	" "
do. Heavy Draft Stallion, Marquis	-	-	Bronze "
C. J. Douglass, Heavy Draft Stallion, Dundonald	-	-	" "
James Swinerton, Agricultural Stallion, Glory of Dominion	-	-	Silver "
J. C. Sanderson do. do. Duke of Newcastle	-	-	" "
J. P. Fisher do. do. Pat Molloy	-	-	" "
James McDonnough, Agricultural Mare, Fannie	-	-	" "
do. Heavy Draft Stallion, Scotsman	-	-	" "
Andrew Somerville, Carriage Stallion, British Splendor	-	-	" "
do. Roadster Stallion, Gladstone	-	-	" "
Edmunston and Snyder, Heavy Draft Stallion, Loch Fergus	-	-	" "
Jeffrey Bros., Heavy Draft Mare, Coldstream Lass	-	-	" "
W. H. Hurdman do. Black Bees	-	-	" "
do. Agricultural Stallion, Farmers' Fancy	-	-	" "
Wm. Boyd, Heavy Draft Span, Tom and Bill	-	-	" "
Wm. Gerrie do. Pollie and Sue	-	-	" "
F. K. Hicks, Agricultural Stallion, Lord Logan	-	-	" "
James McSorley do. Young Cumberland	-	-	" "
George Doidge, Agricultural Mare, Empress	-	-	" "
J. Smith do. do. Dash	-	-	" "
George Currie, Agricultural Span (Mare and Gelding)	-	-	" "
F. McEwen, Roadster Mare, Black Mary	-	-	" "
H. Kennedy, Carriage Span (Mare and Gelding)	-	-	" "
W. Long, Horse, Emperor	-	-	" "
do. Zetland	-	-	" "

## SHEEP.

## LINCOLNS.

Samuel Longford, Granton, Ont., best Ram over 2 years	-	-	Silver Medal.
Do. do. pen breeding Ewes	-	-	" "
Do. do. flock, four Ewes and Ram	-	-	" "
James Healy, Adelaide, Ont., Ram (shearling)	-	-	Bronze "
Do. do. 2 shearling Ewes (twins)	-	-	" "
Samuel Longford, Granton, Ont., three Ewes (shearlings)	-	-	" "

## LEICESTERS.

P. and J. Brooks, Whalen, Ont., best Ram (shearling)	-	-	Silver Medal.
Do. do. 3 Breeding Ewes (shearlings)	-	-	" "
Do. do. 2 Breeding Ewes (lambd 1874)	-	-	Bronze "
Do. do. do. (lambd 1873)	-	-	" "

## COTSWOLD.

Wm. Hodgson and Son, Myrtle, Ont., Ram 1st Grey Faced Prince	-	-	Silver Medal.
Do. do. do. 2nd Grey Faced Prince	-	-	" "
Do. do. do. 4 Breeding Ewes	-	-	" "
Do. do. do. 3 Ewes (shearlings)	-	-	Bronze "
Do. do. do. 2 Ewe Lambs	-	-	" "

## SOUTH DOWNS.

Robert Marsh, Richmond Hill, Ont., Ram (over 2 years)	-	-	Bronze Medal.
Do. do. do. Ram (lambd 1872)	-	-	" "
Do. do. do. Ram Lamb	-	-	" "
Do. do. do. 4 Breeding Ewes	-	-	" "
Do. do. do. 3 Breeding Ewes	-	-	" "
Do. do. do. 3 Ewes (shearlings)	-	-	" "
Do. do. do. 3 Ewes (shearlings)	-	-	" "
Do. do. do. 3 Ewe Lambs	-	-	" "

## SWEEPSTAKES.

Samuel Longford, Granton, Ont., Best Ram (Lincoln)	-	-	Silver Medal.
Do. do. Best Pen Breeding Ewes (Lincolns)	-	-	" "

## SWINE.

## SUFFOLKS.

A. Frank and Sons, Cheltenham, Ont., Sow, Maggy	-	-	Silver Medal.
Do. do. do. White Rose	-	-	" "
Do. do. do. Boar, Tom Bush, and 2 Sows, Maggy and White Rose	-	-	" "
Wright and Butterfield, Sandwich, Ont., Sow, Charity	-	-	" "
Do. do. do. Suffolk Queen	-	-	" "
Do. do. do. do. Faith	-	-	" "
Do. do. do. do. Hope	-	-	" "
Do. do. do. 3 Sows, Faith, Hope, and Charity	-	-	" "
Do. do. do. Boar, Longback, and two Sows, Charity and Suffolk Queen	-	-	" "
Do. do. do. Boar, Longback	-	-	Bronze "
Do. do. do. Boar, Suffolk King	-	-	" "

## BERKSHIRE.

George Newlove, Macville, Ont., Boar, Jim	-	-	Silver Medal.
do. do. Sow, Lady Jane	-	-	Bronze "

## CHESTER WHITES.

Henry Milton, Ridgeton, Ont.,	Sow, Excelsior	-	-	-	Silver Medal.
Do.	do.	Boar, Champion, and two Sows, Excelsior and Slick	-	-	" "
Do.	do.	Sow, Slick	-	-	Eronze "

## Essex.

Wright and Butterfield, Sandwich, Ont.,	Boar, Negro	-	-	-	Silver Medal.
Do.	do.	do. Negro 1st	-	-	" "
Do.	do.	do. Negro 2nd	-	-	" "
Do.	do.	do. Negro 3rd	-	-	" "
Do.	do.	Sow, Princess	-	-	" "
Do.	do.	do. Queen of Essex	-	-	" "
Do.	do.	do. Negro's Best	-	-	" "
Do.	do.	do. Negress 2nd	-	-	" "
Do.	do.	do. do. 3rd	-	-	" "
Do.	do.	Boar, Negro, and two Sows, Princess and Queen of Essex	-	-	" "
Do.	do.	Boar, Negro 1st, and two Sows, Negress 2nd, Negress 3rd	-	-	" "
Do.	do.	3 Sows, Negro's Best, Negress 2nd, Negress 3rd	-	-	" "

## SWEEPSTAKES.

A. Frank and Son, Cheltenham, Ont.,	best Boar, Tom Bush (Suffolk)	-	-	-	Silver Medal.
Do.	do.	Sow, Maggy	-	-	" "

## POULTRY.

H. M. Thomas, Brooklin, Ont.,	Pair of Partridge Cochins	-	-	-	Silver Medal.
Daniel Allen, Galt, Ont.,	pair of black-breasted Red Game Chicks	-	-	-	" "
Duncan Kay, Galt, Ont.,	pair of Silver-Pencilled Hamburg Chickens	-	-	-	" "
Richard McMillan, Galt, Ont.,	one pair Golden Pencilled Hamburg Chickens	-	-	-	" "
John Bogue, London, Ont.,	pair of White-Crested Black Polish Fowls	-	-	-	" "
A. Terrill, Wooler, Ont.,	one pair of Black Carriers	-	-	-	" "
Daniel Allen, Galt, Ont.,	one pair Rouen Ducks	-	-	-	" "
Do.	do.	one pair of Yellow Duckwings Game	-	-	Bronze "
Do.	do.	one pair of black-breasted Red Game Bantams	-	-	" "
Do.	do.	one pair of Black African Bantam Fowls	-	-	" "
Do.	do.	one pair of Aylesbury Ducks	-	-	" "
Do.	do.	one pair of brown-breasted Red Game Chickens	-	-	" "
Richard McMillan, Galt, Ont.,	one pair of Golden-Spangled Fowls	-	-	-	" "
Duncan Kay, Galt, Ont.,	one pair Black Spanish Fowls	-	-	-	" "
John Bogue, one pair Silver-Gray Fowls	-	-	-	-	" "
H. M. Thomas, one pair of Lafleche Fowls	-	-	-	-	" "
H. Cooper, Hamilton, Ont.,	one pair of Silver Duckwing Fowls	-	-	-	" "
Do.	do.	one pair of Blue Fantails	-	-	" "
Do.	do.	one pair of Barbs	-	-	" "
Do.	do.	one pair of White Trumpeters	-	-	" "
W. M. Campbell, Brooklin, Ont.,	one pair of red-pile Game Bantam Chickens	-	-	-	" "
W. H. Doel, Toronto,	one pair black-breasted red Game Bantam Chicks	-	-	-	" "
W. McNeil, London, Ont.,	one pair of Bearded Polish Chicks	-	-	-	" "

## DAIRY PRODUCTS.

## SAMPLE OF BUTTER, 200 POUNDS OR MORE.

Wm. Dunn	-	-	-	-	-	Silver Medal.
Hettle and Inglis	-	-	-	-	-	Bronze "
John McClurg	-	-	-	-	-	" "

## PACKAGE OF BUTTER, 10 TO 35 POUNDS OR MORE.

Michael Ballantyne	-	-	-	-	-	-	-	Silver Medal.
Wm. Dunn	-	-	-	-	-	-	-	Bronze „
R. W. Bass	-	-	-	-	-	-	-	„ „

## SAMPLE OF BUTTER OF 5 POUNDS, IN 1 POUNDS OR ROLLS.

Hettle and Inglis	-	-	-	-	-	-	-	Silver Medal.
Michael Ballantyne	-	-	-	-	-	-	-	Bronze „
John McClurg	-	-	-	-	-	-	-	„ „

## THREE CHEESE (COLOURED) OF 40 POUNDS OR OVER.

Made any time in the second or third weeks of June, July, August, and  
September 1876, respectively.

Peter Dunn	-	-	-	-	-	-	-	Silver Medal.
Hugh Matheson	-	-	-	-	-	-	-	Bronze „
David Morton	-	-	-	-	-	-	-	„ „

## DAIRY CHEESE.

Michael Ballantyne	-	-	-	-	-	-	-	Silver Medal.
Thomas Hawkins	-	-	-	-	-	-	-	Bronze „

## THREE CHEESE (COLOURED) OVER 40 POUNDS.

David Chalmers	-	-	-	-	-	-	-	Silver Medal.
Adam Bell	-	-	-	-	-	-	-	Bronze „
H. S. Losee	-	-	-	-	-	-	-	„ „
James Elliott	-	-	-	-	-	-	-	„ „

## THREE CHEESE (COLORED) UNDER 40 POUNDS.

Adam Bell	-	-	-	-	-	-	-	Silver Medal.
James Ireland	-	-	-	-	-	-	-	Bronze „
Peter Dunn	-	-	-	-	-	-	-	„ „

## THREE CHEESE (COLOURED) UNDER 30 POUNDS.

Peter Dunn	-	-	-	-	-	-	-	Best.
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## THREE CHEESE UNDER 20 POUNDS.

Peter Dunn	-	-	-	-	-	-	-	Best.
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## THREE CHEESE (WHITE) over 40 POUNDS.

Thomas Ballantyne	-	-	-	-	-	-	-	Gold Medal.
Alex. Mackenzie	-	-	-	-	-	-	-	Silver „
Wm. Gillard	-	-	-	-	-	-	-	Bronze „

## THREE CHEESE (WHITE) UNDER 40 POUNDS.

Peter Dunn	-	-	-	-	-	-	-	Silver Medal.
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The Judges subjoin a statement to the effect that Mr. Peter Dunn's exhibit was the best in Four Classes.

By order,  
Canadian Commission,  
J. FERRAULT, Secretary.

## AWARDS TO CANADIAN EXHIBITORS, INTERNATIONAL COMPETITION.

## I.—MINERALS, MINING, METALLURGY, AND MACHINERY.

P. T. Somerville, Arnprior, Ont., Monuments of Dark-clouded Marble of Arnprior.  
 New Rockland Slate Co., Montreal, Roofing Slate and Slate Slabs from Melbourne, Canada.  
 Ontario Lithographic Stone Co., Marmora, Ont., Lithographic Stone.  
 R. Robertson, Halifax, N.S., Gold Specimen.  
 A. Seaman and Co., Lower Cove, N.S., Grindstones.  
 Daniel and Boyd, St. John, N.B., Block of Freestone.  
 Dorchester Union Freestone Co., Dorchester, N.B., Building Stone.  
 Robert Forsyth, Montreal, Red Granite Monuments, &c., from Gananoque.  
 Geo. J. McDonald and Co., Cornwallis, N.S., Building Stone.  
 John Kelly, Belleville, Ont., Lithographic Stones.  
 Bay of Fundy Red Granite Co., St. George, N.B., Wrought Red Granite.  
 Gray, Young, and Sparling, Eclipse Well, Seaforth, Ont., Refined Salt.  
 Waterman Bros., London, Ont., Petroleum.  
 Lake George Antimony Co., Prince William, N.B., Regulus of Antimony.  
 Joseph Goodfellow, North Esk, N.B., One large Grindstone.  
 Dominion of Canada Plumbago Co., Graphite and Products manufactured therefrom.  
 Danville Slate Co., Danville, Que., Slate.  
 Alex. Cowan, Brockville, Ont., Phosphate of lime, Pyrites, &c.  
 Hopewell Quarry Co., Hopewell, N.B., Sandstone.  
 W. W. Stewart, Montreal, Native Copper.  
 John Rankin, Actonvale, collection of Coloured Slates.  
 Gatling Gold and Silver Mining Co., Marmora, Ont., Gold Ores.  
 Dr. Honeyman, Halifax, N.S., Geological Collection.  
 Steel Co. of Canada, Londonderry, N.S., Ores, Iron and Steel.  
 Nova Scotia Section of Canada Commission, Nova Scotia, Collection of Building Stones.  
 Nova Scotia Advisory Board, Coals.  
 Geological Survey of Canada, Geological Collection.  
 Silver Islet Mining Co., Silver Islet, Ont., Silver and Silver Glance.

## II.—POTTERY, GLASS, ARTIFICIAL STONE, &amp;c.

St. John's Stone Chinaware Co., St. John's, Que., White "Granite" Wares.  
 Lee Bros., St. John, N.B., Common Hard Bricks.  
 Albert Manufacturing Co., Hillsborough, N.B., Raw and Calcined Gypsum.  
 Bulmer and Sheppard, Montreal, Common Bricks.  
 Wm. McKay, Ottawa, Hydraulic Cement.  
 George Sylvester Tiffany, London, Ont., Brick and Tile-Making Machine.  
 P. Gauvreau and Co., Quebec, Hydraulic Cement and Artificial Stones.  
 Dominion of Canada Plumbago Co., Buckingham, Plumbago Crucibles.

## III.—CHEMISTRY AND PHARMACY, WITH THE APPARATUS.

Waterman Bros., London, Ont., Paraffine, &c.  
 O. V. Troop and Co., St. John, N.B., Vinegar.  
 T. Ramsay, Montreal, Pigment.  
 A. Ramsay and Son, Montreal, Paints.  
 Lyman Bros., Toronto, Chemicals.  
 Lyman, Clare, and Co., Montreal, Pigments, Oils, &c.  
 M. Lefevre, Montreal, Vinegar.  
 International Salt Co., Goodrich, Ont., Salt.  
 Wm. Hessin, Toronto, Ont., Bonbons, &c. of sugar.  
 Harrison and Evans, Goodrich, Ont., Salt.  
 Gray, Young, and Sparling, Seaforth, Ont., Salt.  
 Robert Freeland, Montreal, Machine for Boiling Soap under Pressure.  
 Buchanan Mineral Co., Hamilton, Ont., Mineral Paint.  
 George W. Morse and Co., Toronto, Soaps and Tallow Candles.  
 A. W. Hood and Son, Montreal, Soaps.  
 Alexander Cowan, Brockville, Super-phosphate and its Materials.  
 Albert Toilet Soap Co., Montreal, Soaps and Oils.

IV.—ANIMAL AND VEGETABLE PRODUCTS.

J. A. Robins, Avon, Cheese.  
 E. Hunter, Mt. Elgin, Cheese.  
 Anna Paddon, Beachville, Cheese.  
 James F. Williams, Galloway, Ingersoll, Cheese.  
 Hugh Mathison, Embro, Cheese.  
 E. Hunter, Mt. Elgin, Cheese.  
 D. Chambers, Stratford, Cheese.  
 David Morton, Cassels, Cheese.  
 Thomas Ballantyne, Ont., Stratford, Cheese.  
 William Huxley, Fullerton, Cheese.  
 John Butler, Mt. Elgin, Cheese.  
 J. W. Cahoe, Derham, Cheese.  
 D. B. Cahoe, Holbrook, Cheese.  
 Peter Dunn, Ingersoll, Cheese.  
 Brodie and Harvie, Montreal, Flour.  
 George Smith, Verschoyle, Cheese.  
 W. F. Howland, Toronto, Wheat.  
 Christie, Brown, and Co., Toronto, Biscuits and Crackers.  
 T. Rankine and Sons, St. John, N.B., Fancy Biscuits.  
 James Collins, Erin, Ont., Wheat.  
 R. Sugg, Minto, Ont., Wheat.  
 John Campbell, Hullet, Ont., Wheat.  
 R. Tuck, Nelson, Ont., Wheat.  
 Wm. Beattie, Nichol, Ont., Wheat.  
 Catelli Bros., Montreal, Macaroni, Soup Pastes, &c.  
 M. R. Spinelli, Montreal, Macaroni, Soup Pastes, &c.  
 Wm. Wilkinson, Ingersoll, Cheese.  
 H. S. Losee, Norwich, Cheese.  
 William Anderson, Woodstock, Cheese.  
 Shirk and Snider, Bridgeport, Ont., Flour from Winter Wheat.  
 Matthew Meams, Durham, Ont., Wheat.  
 Wm. P. O'Neil, Watertown, Ont., Wheat.  
 James S. Morton, Salisbury, N.B., Wheat.  
 Thomas J. Skinner, Courtsher, B. Col., Wheat.  
 R. Shearer, Niagara, Ont., Wheat.  
 Wm. McGill, York Co., Ont., Wheat.  
 James Bell, Tuckersmith, Ont., Wheat.  
 Wm. Bell, Tuckersmith, Ont., Wheat.  
 Jacob Scip, Petersburg, Ont., Wheat.  
 George Stonehouse, Scarborough, York co., Barley.  
 C. H. Moyer, Campden, Ont., Bohemian Oats.  
 Thomas McKay and Co., Ottawa, Oatmeal.  
 H. Warton, Guelph, Oatmeal.  
 Lawrence Rose, Georgetown, Buckwheat Flour.  
 Scott and Co., Highgate, Oatmeal (four varieties).  
 Aspden and Pritchard, London, Oatmeal (four varieties).  
 James Wilson, Fergus, Oatmeal.  
 E. D. Tilson, Tilsonburg, Oatmeal and Buckwheat Flour.  
 Starr Mills, Bridgetown, Buckwheat Flour.  
 P. Francis, Brooklin, Oatmeal (three samples, different varieties).  
 Howard and Northwood, Chatham, Malt.  
 John Labatt, London, Malt.  
 Canadian Meat and Produce Co., Sherbrooke, Que., Pickles, Sauces, and Soups.  
 Lamus Smith, Chatham, Ont., Oats.  
 Thomas Manderson, Myrtle, Ont., Oats.  
 Charles Anderson, Hastings, Ont., Oats.  
 Mrs. Jane Taylor, Stanley, York, N.B., Oats.  
 John Stewart, Horton, Renfrew, Rye.  
 T. M. Howser, Camden, Lincoln Co., Ont., Clover Seed.  
 William Smith, Fairfield Plains, Ont., Clover Seed.  
 Robert Agur, Pond Mills, Ont., Coloured Cheese.  
 John Chisholm, East Missouri, Ont., Coloured Cheese.  
 William Wilkinson, Ingersoll, Ont., Coloured Cheese.  
 Mark Challeroft, Thamesford, Coloured Cheese.  
 J. F. Williams, Galloway, Ont., Pale Cheese for shipping.

Adam Bell, Blanford, Pale Cheese for shipping.  
 William Manning, Belmont, Ont., Coloured Cheese.  
 Mission of Chipogan, Lake Alatska, Wheat and Barley.  
 Edwin Casswell, Ingersoll, Ont., Hams, Breakfast Bacon, Smoke-dried Sides, Prime Mess Pork.  
 Christian Nets, Halifax, N.S., Bologna Preserve in Lard.  
     Do.                      do.                      Smoked Goose, Ham, Ox Tongue.  
 W. Woodill, Halifax, Nova Scotia, Mess Beef.  
 Canadian Meat and Produce Co., Sherbrooke, Canned Meat in great variety.  
 Edwardsburg Starch Co., Edwardsburg, Starch.  
 R. B. Noble, Richibucto, N.B., Preserved Fruit (blueberries).  
 J. W. Butcher, Halifax, N.S., Preserved Fruit (Strawberry and Cranberry Jelly).  
 J. D. Bain, Restigouch, N.B., canned Roast Beef.  
 S. Davis and Co., Montreal, Cigars.  
 James Ireland, Ingersoll, Cheese.  
 T. Manderim, Myrtle, Ont., Wheat.  
 R. McGill, Erin, Ont., Wheat.  
 Alex. Stewart, Brussels, Ont., Wheat.  
 William Rennie, Toronto, Garden and other Seeds.  
 J. H. Allan, Picton, Ont.  
 Advisory Board of Halifax, N.S., Exhibit of Seeds.  
     Do.                      do.                      Nova Scotia, N.S., Various Seeds other than Cereals.  
     Do.                      do.                      Manitoba, Manitoba, Seeds, Wild Hops, Wild Tea, &c.  
     Do.                      do.                      Ontario, Sundry Seeds other than Cereals.  
     Do.                      do.                      P. E. Island, Charlottetown, Oats.  
 Council of Agriculture, Montreal, Sundry Field Seeds.  
 Charles Henry, Conestoga, Ont., Linseed.  
 E. Casswell, Ingersoll, Ont., Cheese.  
 P. Hemmingway, Corinth, Ont., Cheese.  
 Thomas Hankins, Holbrook, Ont., Cheese.  
 W. Weatherston and Co., Toronto, Ont., Flour.  
 J. G. King, Canada, Port Hope, Toronto, Ont., Flour from Winter Wheat.  
 Indians of Douglass Lake, British Columbia, Wheat.  
 John Labatt, London, Ont., Ale and Stout.  
 T. Davies and Bro., Toronto, Ale and Porter.  
 Cosgrove and Co., Toronto, Bottled Ale.  
 Agnew L. Farrell, Cayuga, Ont., Wines.  
 James Hustings, White Church, Wine.  
 R. Blackwood and Co., Montreal, Ginger Ale.  
 V. Casci, St. Vincent, Toronto, Cherry Wine.  
 Growers' Association, Toronto, Wine and Brandy.  
 D. Nixon, Allisonville, Ontario, Wine.

#### V.—FISH AND FISH PRODUCTS—APPARATUS OF FISHING.

D. Scribner, St. John, N.B., Rods for catching Salmon, &c.  
 F. St. John, Victoria, B.C., Specimens of Prepared Fish.  
 Ewing and Wise, New Westminster, Frazer R., Isinglass.  
 Andrews and Co., Halifax, N.S., Canned Lobster and Mackerel.  
 R. B. Noble, Richebucto, Canned Lobster.  
 Chebucto Packing Co., Halifax, N.S., Canned Lobster.  
 T. Doyle, Halifax, N.S., Tongues and Sounds, Herring, Mackerel.  
 J. D. Bain, Restigouche, N.B., Canned Mackerel, Lobster, and Salmon.  
 Holbrook and Cunningham, Victoria, B.C., Canned Salmon.  
 James Barber, Halifax, N.S., Canned Lobster and Canned Mackerel.  
 A. Loggie and Co., Victoria, B.C., Salted Salmon, Trout, and Oolachen in bbls. and kits.  
 A. H. Crowe, Halifax, N.S., Salted and Dried Haddock, and Smoked Herring, &c.  
 S. P. May, M.D., Toronto, Ont., Prepared Fish.

#### VI.—TIMBER, WORKED LUMBER, PARTS OF BUILDINGS.

Fairbanks and Hawes, St. John, N.B., Doors, Blinds, and Newel-Posts.  
 A. N. Greig, Montreal, Painted Imitations of Wood and Marble.  
 Bronson and Weston, Ottawa, Pine Lumber.  
 Pike and Richardson, Chatnam, Ont., Barrel Hoops.  
 G. B. Hall, Montmorency Mills, Pine Boards.  
 H. P. Cusack, Newburg, Ont., Barrel Hoops.

Levi Young, Ottawa, Pine Lumber.  
 John Rochester, Ottawa, Pine Lumber.  
 Perley and Pattie, Ottawa, Pine Lumber.  
 George Newell, Ottawa, Ash Pillars.  
 John Oliver, Ontario, Worked Lumber.  
 Quebec Advisory Board, Worked Lumber.  
 Wilson, Gilmore, and Co., St. John, N.B., Marbleized Slate Mantels.

#### VII.—FURNITURE, UPHOLSTERY, WOODEN WARE.

Joseph Rye and Co., Montreal, Invalid Chair.  
 William Lee, Toronto, Furniture.  
 J. Wright, Montreal, Parquetry, Flooring.  
 Q. W. Tuerk, Berlin, Ont., Clock-case and Chandeliers in Oak.

#### VIII.—COTTON, LINEN, AND OTHER FABRICS, &C.

Dundas Cotton Mills Co., Hamilton, Brown Sheetings and Seamless Bags.  
 S. S. Fuller, Stratford, Ont., Flax.

#### IX.—WOOL AND SILK FABRICS.

S. H. Powers, Woodstock, N.B., Hand Loom.  
 T. Stavert Fisher, Toronto, Ont., Woollens.  
 John Harvey, Hamilton, Ont., Wool.  
 Toronto Tweed Co., Toronto, Woollens.  
 Adam Lomas and Son, Sherbrooke, Flannels.  
 Samuel F. Willett, Chambly, Flannels.  
 Mills and Utchinson, Montreal, Woollens.  
 John Wardlow, Galt, Ont., Woollen Yarns.  
 Rosamond Woollen Co., Almonte, Woollens.  
 Smith and Wilby, Toronto, Flannels.  
 Oxford Woollen Mills, Oxford, N.S., Woollens.  
 H. Winger, Elmira, Ont., Flannels.  
 J. L. Woodworth, St. John, N.B., Woollen Yarns.

#### X.—CLOTHING, FURS, INDIA-RUBBER GOODS, &C.

Thibault, Lanthier, and Co., Montreal, Furs, Ermine Muffs, &c.  
 Hudson Bay Co., Montreal, Raw Furs, Esquimaux Sealskin Coat, &c.  
 C. Kaiser and Son, Halifax, Natural Raccoon and Black Bear Robes, &c.  
 Reynolds and Volkel, Montreal, Wolf Robes, Rugs, &c.  
 Skelton, Tooke, and Co., Montreal, Shirts, &c.  
 Brown and Clogget, Montreal, Costumes for Ladies.  
 J. S. May, St. John, N.B., Gents' Clothing.  
 C. Boeck, Toronto, Ont., Brushes.  
 Whitehead and Turner, Quebec, Brushes.  
 G. R. Grind, London, Ont., Brooms and Whisks.  
 W. E. Clarke, Toronto, Ont., Trunks, &c.  
 Miss Kate Farrell, Toronto, Ont., Carriage Rugs.  
 Grey Nuns of Montreal, Montreal, Embroidered Handkerchief.  
 General Hospital, Quebec, Artificial Flowers.  
 Convent Jesus and Mary, Quebec, Embroidery, Priests' Vestments.  
 Hochelaga Convent Montreal, Embroidery, Priests' Vestments.  
 Mrs. D. B. McDonald, Montreal, Gobelin Tapestry.  
 Miss Isabella Fairbanks, Halifax, N.S., Lace Handkerchief.  
 Mrs. Sutcliffe, Halifax, N.S., Needlework, "Last Supper."  
 Mrs. Constant, Halifax, N.S., Leather Work for Mirror Frame.  
 Mrs. Farrel, Halifax, N.S., Fancy Wool Work.  
 Mrs. R. A. Wicksteed, Ottawa, Point Lace.  
 Miss Lizzie Farquharson, Whitby, Painting on Velvet, Designs for Painting.  
 Miss Park, Watertown, Knitting and Tatting.  
 Mrs. Neville, Ottawa, Leather Work.  
 Miss Sidney Smith, Dundas, Lacework Handkerchief.  
 Mrs. Nunn, Belleville, Point Lace.  
 McCrae and Co., Guelph, Ont., Hosiery.  
 Ancaster Knitting Co., Hamilton, Ont., Knitted and Fancy Goods.  
 R. F. Taylor and Son, Toronto, Ont., Men's Clothing.  
 T. G. Furnival, Hamilton, Ont., Clothing.

**XII.—LEATHER AND MANUFACTURES OF LEATHER, &C.**

David Ramsay, Coburg, Ont., Boots and Shoes.  
 William Craig and Son, Port Hope, Ontario, Leather.  
 Heath and Northey, Montreal, Sole Leather.  
 Moseley and Ricker, Montreal, Leather.

**XIII.—PAPER, STATIONERY, PRINTING, AND BOOK-MAKING.**

Saint Croix River Mills, Saint Croix, N.S., Binders' Pasteboard.  
 Louis Ferrault and Co., Montreal, Commercial Printing.

**XIV.—HARDWARE, EDGE TOOLS, CUTLERY, AND METALLIC PRODUCTS.**

James McElvey, St. Catharines, Cream Gatherer.  
 Alexander Anderson, Bread Knife.

**XV.—BUILDERS' HARDWARE, TOOLS, CUTLERY, &C.**

Dates Pat. Steel Co., Toronto, Axes and Edge Tools.  
 James Warnock and Co., Galt, Ont., Axes and Edge Tools for Wood, Iron, and Stone.  
 W. and M. Amhern, Ottawa, Ontario, Lumbermen's Tools.  
 Peter Robertson, Ottawa, Ont., Lumbermen's and Stonecutter's Tools.  
 Thomas Moore, Cooksville, Ont., Axe and Tool Handles.  
 R. A. Smith and Co., St. Catharines, Ont., Saws.  
 Spiller Bros., St. John, N.B., Edge Tools.  
 S. R. Foster and Son, St. John, N.B., Nails, Tacks, Brads, &c.  
 Pillow, Hersey, and Co., Montreal, Quebec, Nails, Tacks, Brads, and Horse Shoes.  
 Starr Manufacturing Co., Halifax, N.S., Skates.  
 Gauvin Gilmore, Cote, Montreal, Augurs, Bits, &c.  
 A. S. Whiting Manufacturing Co., Oshawa, Ont., Forks, Hoes, Scythes, &c.

**XVII.—CARRIAGES, VEHICLES, AND ACCESSORIES.**

Hunt, Cairns, and Co., St. Catharines, Ont., Wheels and Wheel Stock.  
 Robert Malcolm, Toronto, Ont., Harness and Saddles.  
 William Vahey, Forrest, Ont., Collars and Collar Blocks.  
 William Kerr and Son, Beamsville, Ont., Dog Cart Sleigh.  
 B. Ledoux, Montreal, Sleigh.  
 John M. De Wolfe, Halifax, N.S., Light Carriages.  
 S. and H. Borbridge, Ottawa, Ont., Harness and Saddles.  
 Daniel Conroy, Uxbridge, Sleigh.

**XVIII.—RAILWAY PLANT, ROLLING STOCK, ENGINES, &C.**

Toronto Car-wheel Co., Toronto, Ont., Car Wheels of Chilled Iron.  
 John McDougal and Co., Montreal, Car Wheels of Chilled Iron.

**XIX.—VESSELS AND APPARATUS OF TRANSPORTATION.**

William English, Peterborough, Ont., Hunting Canoe.  
 D. Herald, Gores Landing, Ont., Hunting Canoe.  
 Coldbrook Rolling Mill Co., St. John, N.B., Iron Ship Knees.

**XX.—MOTORS, HYDRAULIC AND PNEUMATIC APPARATUS.**

C. C. Jones, Fredericton, Barrel Pump.  
 Wilson, Clark, and Co., Yarmouth, N.S., Ship Pump.  
 John D. Ronald, Chatham, Ont., Steam Fire Engine.  
 A. A. Murphy, Montreal, Pneumatic Fire Extinguisher.  
 S. Webster, St. Catharines, Ont., Oil Storing Tank.  
 Waterous Engine Works, Brantford, Steam Engines.

H. W. Cox, Peterborough, Ont., Rotary Force Pumps.  
 Oakville Manufacturing Co., Oakville, Ont., Pumps.  
 Robert Patrick, Galt, Ont., Rotary Pump.  
 Robert Bustin, St. John, N.B., Fire Escape.  
 Dixon, Smith, and Co., Toronto, Belting.  
 Barber and Harris, Meaford, Ont., Water Wheel.  
 Wm. Kennedy and Sons, Owen Sound, Ont., Water Wheel.  
 George Fleming and Sons, St. John, N.B., Oscillating Engines.  
 Bowes and Sons, Stratford, Ont., Force Pumps.  
 C. Barns, Sackville, N.B., Rotary Pumps.  
 John Ritchie and Sons, Toronto, Ont., Cocks, Valves, and Lubricators.  
 James Morrison, Toronto, Ont., Steam Vacuum Hydraulic Gauges.  
 George Brush, Montreal, Steam Engine.  
 M. E. Dailey, Ottawa, Ont., Telescope Trestle.  
 Small and Fisher, Woodstock, N.B., Barrel Lifter.  
 Thomas Williams Manufacturing Co., Stratford, Ont., Stationary Engine.  
 John Date, Montreal, Diving Apparatus.  
 Goldie and McCulloch, Galt, Ont., Turbine Water Wheel and Steam Engine.  
 F. W. Tuerk, Berlin, Ont., Working Model Water Wheel.

#### XXI.—MACHINE TOOLS FOR WOOD, METAL, AND STONE.

R. Mitchell and Co., Montreal, Lead Tube Bending Machine.  
 Brown and Howe, St. John, N.B., Turning Lathe.  
 W. M. Kennedy and Sons, Owen Sound, Ont., Facing and Jointing Machine.  
 J. F. Fisher and Co., Kinkardine, Ont., Clipping Boiler Plate Machine.  
 McKeshnie and Bertram, Dundas, Ont., Wood Moulding Machine.  
 Mitchell and Taple, Harrison, Ont., Wood Sawing Machine.  
 R. H. Smith and Co., St. Catharines, Circular Saws.  
 Waterous Engine Works Co., Brantford, Ont., Portable Saw.

#### XXII.—MACHINE AND APPARATUS USED IN SEWING, &c.

Wilkie and Osborne, Guelph, Ont., Sewing Machine Treadle.  
 R. M. Wanzer and Co., Hamilton, Ont., Lock Stitch Sewing Machine.

#### XXIII.—AGRICULTURAL MACHINES, IMPLEMENTS OF AGRICULTURE, &c.

David Maxwell, Paris, Ont., Power Chaff Cutter.  
 Mossey Manufacturing Co., Sharpe's Patent Dumping Horse Rake.  
 L. D. Sawyer and Co., Hamilton, Ont., Mowers and Reapers.  
 Peter Grant, Clinton, Ont., Hay Fork and Conveyer.  
 Thomas Yeandle, Stratford, Ont., Single Plough.  
 Monroe and Agar, Seaforth, Common Plough.  
 C. Duperrow, Stratford, Ont., Iron Diagonal Harrow.  
 Acton Ploughing Co., Acton, Ont., General Purpose Plough.  
 Thomas Wilson, Ont., Fanning Mill.  
 Clegg, Wood, and Co., Horse Rake.  
 Haggert Bros., Brompton, Ont., Threshing Machines and Horse Gear.  
 Jacob Bricker, Waterloo, Little Champion Thresher.  
 Jos. E. Strona, Ont., Swinging Farm Gate.  
 Rowland Dennis, London, Ont., Combined Potato Digger and Ridging Plough.  
 John Watson, Ayr, Ont., Collection of Agricultural Implements.  
 G. Wilkinson, Aurora, Ont., Double Plough.  
 John Abell, Woodbridge, Ont., Portable Engine and Threshing Machine.  
 A. Anderson, London, Ont., Hand Chaff Cutters.

#### XXIV.—INSTRUMENTS OF MEDICINE, SURGERY, &c.

R. Blackwood and Co., Montreal, Mineral Waters.  
 Charles Wilson, Toronto, Mineral Waters.

#### XXV.—INSTRUMENTS OF PRECISION, RESEARCH, &c.

Dominion Organ Co., Bowmanville, Ont., Reed Organs.  
 Hearn and Harrison, Montreal, Surveying Instruments.  
 Weber and Co., Kingston, Ont., Square Piano.

## XXVI.—ARCHITECTURE AND ENGINEERING.

H. R. Ives and Co., Montreal, Mediæval Wrought Iron Gates, &c.  
Geographical Survey of Canada, Geological Maps.

## XXVII.—PLASTIC AND GRAPHIC ART.

Fowler, Canada, Painting in Water Colours.  
A. N. Greig, Montreal, Imitations of Wood and Marble.  
W. Notman, Montreal, Photographs.  
A. Walker, Halifax, N.L., Gilding on Glass.  
Wm. J. Booth, Toronto, Sign Painting on Glass.  
J. C. Spence, Montreal, Window of Stained Glass.  
Hovenden and Meldrum, Toronto, Painting on Glass.

## XXVIII.—EDUCATION AND SCIENCE.

Lovel Printing and Publishing Co., Montreal, Quebec, School and other Books.  
Hunter, Rose, and Co., Toronto, Useful Publications, Good Printing.  
Nelson Loverin, M.D., Montreal, Loverin's Historical Centograph.  
Canada School Apparatus Manufacturing Co., Toronto, Laboratory and other Apparatus.  
S. P. May, M.D., Toronto, Ont., Collection of Stuffed Animals for Teaching Zoology.  
Department of Public Instruction, Province of Ontario, Canada, Maps, Charts, Models, Text Books, &c.  
Young Men's Christian Association of America and Canada, Chart showing the Location of Agency and Branches, &c.  
Wm. Browne, Toronto, Map Stand.

## XXIX.—HORTICULTURAL APPLIANCES.

V. Casci, Toronto, Fruit Models.  
Prof. Macom, Belleville, Ont., Herbarium.

## XXX.—HORSES.

J. W. White, Ont., Thoroughbred Stallion, Terror.  
C. J. Douglass, Ont., Heavy Draft „ Marquis.  
Wm. Harris, Ont., Carriage Horses.  
Halliburton Kennedy, Ont., Mare and Horse, Carriage Span.  
Wm. Long, Lansing, Ont., Coach Stallion, Emperor.  
David Fisher, Colburn, Ont., Stallion, Carriage.  
Wm. McKenzie, Columbus, Ont., Stallion, Cleveland Boy.  
Andrew Somerville, Huntingdon, Stallion.  
J. P. Fisher, Ont., Stallion, Pat Molloy.  
John Galbraith, Kirby, Ont., Roadster Stallion.  
Do. do. do. Mare.  
Wm. Newhouse, Brompton, Roadster Stallion.  
Ezra Holt, Orono, Ont., Stallion, Carriage, Performer.  
Hugh Cooper, Roadster Stallion.  
J. T. Jenkins, Prince Edward's Island, Trotting Stallion.  
Wm. Clark, Thoroughbred Stallion, Warmambie.  
T. and J. Little, Sandhill, Ont., Draft Horse.  
Wm. Long, Lansing, Ont., English Draft Stallion.  
W. Hurdman, Ottawa, Ont., Draft Stallion, Farmer's Fancy.  
Do. do. Mare, Black Bess.  
J. and D. Boag, Ravenshoe, Ont., Filly.  
Do. do. Mare, Agricultural Fancy.  
Do. do. do.  
Do. do. do.  
Do. do. Draft Mare, Jean.  
Do. do. Heavy Draft Stallion, Duncloinnall.  
Do. do. Mare.  
Jeffrey Bros., Whitby, Ont., Mare.  
Do. do. Draft Mare.  
John Smith, Raglan, Ont., Filly.  
Do. do. Draft Mare.

Henry Sarter, Pontonby, Ont., Draft Mare.  
 Do. do. Filly.  
 John Glen, Carlow, Ont., Draft Mare.  
 Do. do. Filly.  
 Do. do. do.  
 George, Dodge Columbus, Ont., Draft Mare.  
 Do. do. Filly.  
 W. H. Hurdman, Ottawa, Ont., Draft Mare.  
 George Currie, Ingersoll, Ont., Draft Mare.  
 Do. do. Horses.  
 C. J. Douglas, Oak Ridge, Ont., Stallion.  
 C. E. Mason, Brucefield, Ont., Stallion.  
 Alex. Burgess, Weston, Ont., Stallion.  
 D. B. Hick, Mitchell, Ont., Stallion.  
 T. J. Little, Sandhill, Ont., Stallion.  
 Joseph P. Fisher, Ben Miller, Ont., Carriage Stallion, Young Peacock.  
 James McDonnough, Carlow, Ont., Mare.  
 Wm. Gerrie, Dundas, Ont., Mare.  
 Do. do. Heavy Matched Draft Teams.  
 Wm. Boyd, Toronto, Ont., Heavy Matched Draft Teams.

## XXXI.—CATTLE.

George Rudd, Guelph, Ont., Devon Bull, Hartland.  
 Do. do. do. Duke of Wellington.  
 G. Hood, Guelph, Ont., Hereford Cow, Victoria.  
 Do. do. Bull, Victor 3rd.  
 Do. do. Robin Hood.  
 Do. do. Hero.  
 George Thompson Bright, Ont., Ayrshire Cow, Mermaid, four years old.  
 William Miller, jr., Athens, Ont., short-horn Heifer, 2nd Rose of Oxford.  
 Do. do. do. Necklace 7th.  
 Do. do. do. Young Arabella.  
 J. and R. Hunter, Alma, Ont., Herd of Short-Horn Cattle, one Bull and four Cows.  
 Do. do. short-horn cow, Rose Blossom.  
 Do. do. bull, Ranger.  
 Do. do. heifer, Belle of Sunnyside.  
 Do. do. Maid of Honour, 2nd.  
 Do. do. bull, Lord of Aberdeen.  
 James Russell, Richmond Hill, Ont., Short-Horn Bull, High Sheriff, 2nd.  
 Do. do. do. cow, Isabella.  
 Do. do. do. bull, High Sheriff.  
 Do. do. do. heifer, 3rd Duchess of Springwood.  
 George Hood, Guelph, Ont., one black Galloway Cow, Lady Isabella.  
 Do. do. do. Lily Dale.  
 Do. do. do. bull, Roger.  
 Do. do. one herd of Galloways, one Bull and four Cows.  
 Satchell Bros., Ottawa, Ont., Short-Horn Heifer.  
 Do. do. Grade, Short-Horn ox, Lord Dufferin.  
 Thomas Boak, Short Horn bull, Duke of Cumberland.  
 Dominion of Canada, Canadian herd of Short-Horns, one Bull and four Cows.  
 W. B. Telfer, Ponsonby, Ont., Short-Horn Heifer, Duchess of Kent.  
 Do. do. Maid of Kent 2nd.  
 Do. do. Maid of Rosedale 2nd.  
 Do. do. Bull, 3rd Duke of Kent.  
 William Rodden, Plantagenet, Ont., Jersey cow, Pride of Home, two years old.

## XXXII.—SHEEP.

Robert Marsh, Richmond Hill, Three Ewe Lambs, Southdown.  
 Do. do. Six Shearling Ewes, do.  
 Do. do. Three Breeding Ewes, do.  
 Do. do. Flock, one Ram, four Ewes, do.  
 Do. do. Southdown Ram (lamb).  
 Do. do. Ram, four years old, Southdown.  
 Do. do. Ram, three years old, do.

Samuel Langford, Granton, Lincolnshire Ram.

Do. do. Flock, one Ram, four Ewes, Lincolns.  
 Do. do. Three breeding Ewes, Lincolns.  
 Do. do. Flock, three Ewes, Shearlings, Lincolns.  
 Do. do. Lincoln Ram, bred by Richard Gibson.  
 Do. do. Pen of three Breeding Ewes, Lincolns.

Wm. Hodgson and Sons, Myrtle, Three Shearling Ewes, Cotswolds.

Do. do. Three Breeding Ewes, do.  
 Do. do. one Ram, 2nd Gray-faced Prince, do.  
 Do. do. Shearling Ram, 1st Gray-faced Prince, do.  
 Do. do. One ram, four Ewes, do.  
 Do. do. Three Breeding Ewes.

P. J. Brooks, Whalen, Four Ewes, one Ram, Leicesters.

Do. do. Flock, nine Shearling Ewes, Leicesters.

James Healy, Adelaide, Lincoln Ram, "Victory."

Do. do. Flock, three Shearling Ewes, Lincolns.

Dominion of Canada, Ram and six Ewes.

### XXXIII.—SWINE.

Wright and Butterfield, Sandwich, Ont., Suffolk Sows, Faith, Hope, and Charity.

Do. do. Suffolk Boar and two Sows, Longback, Charity, Suffolk Queen.  
 Do. do. Essex, three Sows, Negro, Best Negress 2nd, Negress 3rd.  
 Do. do. Essex Boar and two Sows, Negro, Princess, Queen of Essex.  
 Do. do. Negro 1st, Negress 2nd, and Negress 3rd.  
 Do. do. Essex Sow and nine Pigs, Negress 2nd.  
 Do. do. do. and four Pigs, Negress 3rd.  
 Do. do. do. Queen of Essex.  
 Do. do. do. Negro's Best.  
 Do. do. do. Negress 2nd.  
 Do. do. do. Negress 3rd.  
 Do. do. do. Princess.  
 Do. do. do. Essex boar, Negro 4th.  
 Do. do. Suffolk Sow, Suffolk Queen.  
 Do. do. Essex Boar, Negro 3rd.  
 Do. do. Suffolk Boar, Longback.  
 Do. do. Essex Boar, Negro 2nd.  
 Do. do. Suffolk Boar, Suffolk King.  
 Do. do. Suffolk Sow, Charity.  
 Do. do. Essex Boar, Negro 1st.  
 Do. do. Suffolk Sow, Faith.  
 Do. do. Essex Boar, Negro.  
 Do. do. Suffolk Sow, Hope.

A. Frank and Son, Cheltenham, Ont., Suffolk Boar and two Sows, Tom Bush, Maggie, White Rose.

Do. do. two Suffolk Boars, Tom Bush and———.  
 Do. do. Suffolk Sow, White Rose.  
 Do. do. Suffolk Sow, Maggie.

George Newlove, Mackoile, Ont., Berkshire Sow, Lady Jane.

Do. do. Berkshire Boar, Bully Crawford.

### XXXIV.—POULTRY.

H. M. Thomas, Brooklin, Ont., Variety of Fowls.

Do. do. Variety of Fowls.  
 Do. do. Fowls.  
 Do. do. Fowls.

W. H. Doel, Toronto, Ont., Variety of Fowls.

Do. do. Geese.  
 Do. do. Variety of Fowls.

Platt Hinman, Grafton, Ont., Ducks.

A. Terrill, Wooler, Ont., Geese.

Do. do. Ducks.

Daniel Allen, Galt, Ont., Ducks.

Do. do. Four pair Black-Red Game Fowls and Two Pair Chicks.  
 Do. do. Variety of Fowls.

John Bogue, London, Ont., Ducks.  
 Do. do. Fowls.  
 Do. do. Fowls.  
 Do. do. Fowls.  
 M. W. Smith, Fairfield Plains, Ont., Ducks.  
 Do. do. Geese.  
 Do. do. Fowls.  
 W. M. Campbell, Brooklin, Ont., Hamburgs.  
 Duncan Kay, Galt, Ont., Hamburgs.  
 Do. do. Fowls.  
 Do. do. One Pair Silver Duck-Wing Bantams.  
 H. T. Waddell, Hamilton, Ont., Hamburgs.  
 Richard McMillan, Galt, Ont., Hamburgs.  
 Do. do. Fowls.  
 Do. do. Variety of Fowls.  
 Thomas Pillow, London, Ont., Fowls.  
 John Weld, London, Ont., Fowls.  
 W. G. Hewson, Oakville, Ont., Fowls.  
 William Campbell, Brooklin, Ont., Fowls.  
 H. Cooper, Hamilton, Ont., Pigeons.  
 Do. do. One Pair Silver Duck-Wing Bantams.  
 M. M. Campbell, Brooklin, Ont., Variety of Fowls.  
 Perley and McCummings, Paris, Ont., Variety of Fowls.  
 James H. M. Thomas, Brooklin, Ont., Variety of Fowls.  
 James Beswick, Toronto, Ont., Variety of Fowls.

#### XXXV.—SPECIAL AWARDS.

L. H. Smith, Strathroy, Ont., Imported English Setter Dog "Leicester."  
 Do. do. do. do. "Llewellen."  
 Do. do. do. do. "Paris."  
 Do. do. do. do.

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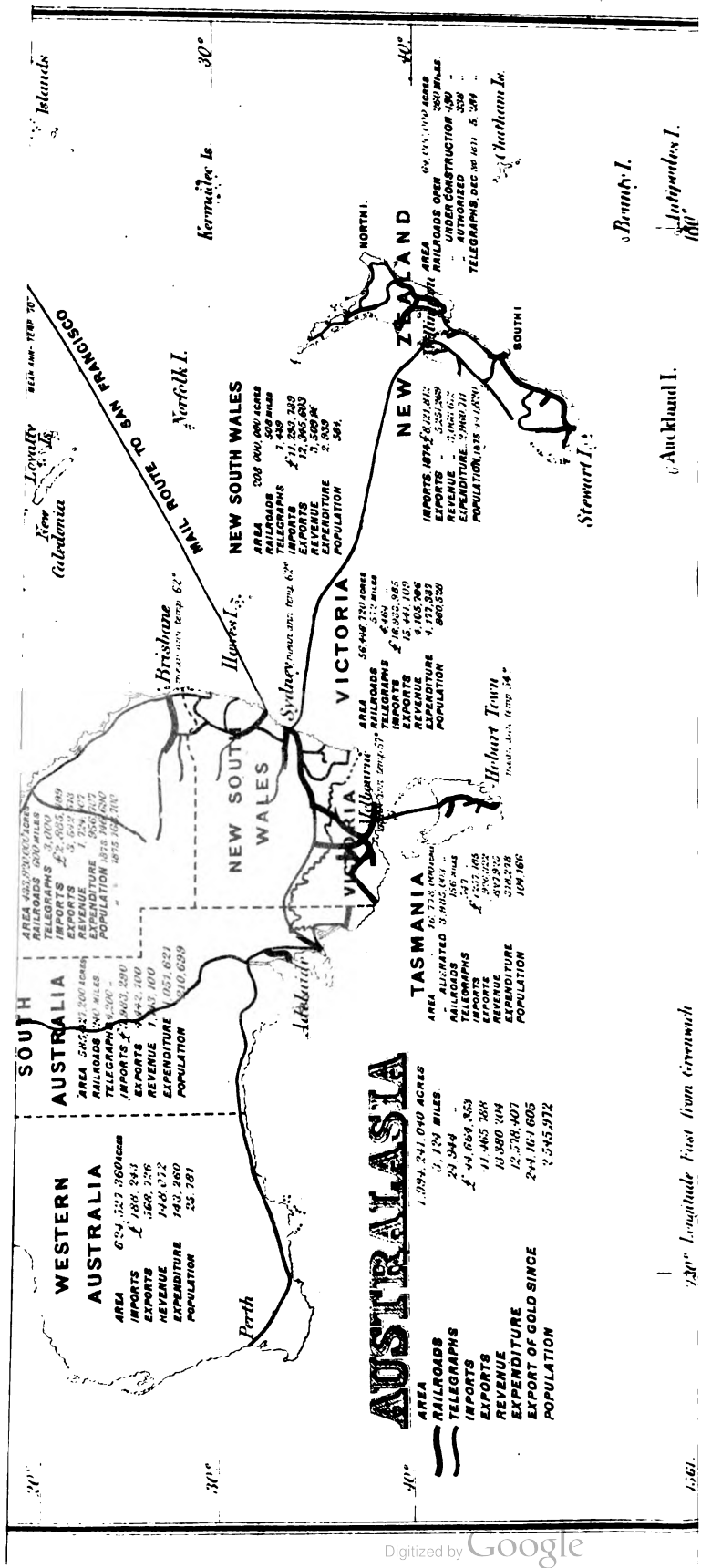
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NEW SOUTH WALES.

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# COMMISSION FROM NEW SOUTH WALES TO THE PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.

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## NEW SOUTH WALES.

### REPORT FOR THE BRITISH COMMISSION.

New South Wales was the first British Colony planted in Australia. Its boundaries extended along the whole of the eastern coast of the Island, and included all the territory lying between the Pacific Ocean and the 135th parallel of east longitude. In the progress of settlement it became expedient to subdivide this extensive area, and to call into existence the colonies of Tasmania, Victoria, and Queensland. Remote from the seat of government, and almost excluded from traffic and intercourse with the civilised populations of the globe, the progress made by the pioneers of civilisation was slow; and, prior to the discovery of gold in New South Wales in 1851, the total European population of the continent was less than 300,000 souls. From that time the occupation and improvement of the country have been accelerated, and Australia has now become the home of upwards of 2,300,000 thriving and contented people. The aggregate revenue of her governments in 1875 was 11,264,646*l.*, and the value of her trade 77,822,042*l.* An area of 3,480,297 acres had been brought under cultivation, and the live stock, almost wholly supported by the natural pasturage of the country, included 52,000,000 sheep, 6,389,000 horned cattle, 835,393 horses, and 549,808 pigs. There had been constructed 1,666 miles of railway, 21,616 miles of telegraph, and many large public works for the improvement of the country.

Its original boundaries.

Subdivisions into New South Wales, Victoria, Queensland, and Tasmania. Progress from discovery of gold to present time.

Revenue, trade, area under cultivation, live stock, and miles of railway and telegraph.

Of the estimated area of Australia (3,000,000 square miles), New South Wales includes 323,437 square miles or less than one-tenth of the entire surface. Its eastern boundary, extending from Cape Horn, in 37° 28' to Point Danger in 28° 10' south latitude, is washed by the Pacific Ocean. Queensland bounds the colony on the north, South Australia on the west, and Victoria on the south-west. The coast line is formed of rugged promontories, rounded bays, and precipitous cliffs of sandstone. The indentations are nowhere strongly marked, but there are numerous capacious harbours for shipping, some of them almost unrivalled for their facility of access, their great extent, natural beauty, and perfect safety. Of these Port Jackson, on whose shore the City of Sydney has been built, is pre-eminent, and that of Newcastle at the mouth of the Hunter River is as well known by reason of its large coal trade in the southern hemisphere as is Newcastle-upon-Tyne in the northern. Among other commodious havens for shipping, Twofold Bay and Jervis Bay to the south of Sydney may be named, and to the north of it are Broken Bay, Port Stephens, Tail Bay, the estuaries of the Clarence, the Richmond, the Manning, and other rivers. Sand bars occur near the entrances to most of the rivers; but the impediments which exist to navigation are such as may be removed by the construction of breakwaters, and by the employment of dredgers whenever the exigencies of the local trade shall justify the carrying out of such improvements.

Proportion of area of Colony to the aggregate of the Continent. Boundaries.

Harbours.

A chain of mountains, commonly described as the Main Dividing Range, runs almost parallel with the coast—distant from it in some places not more than 25 miles, while in others it recedes about 120 miles. Its peaks attain their highest altitude (7,000 feet) in the south, but the general elevation above the sea level is not more than from 2,000 to 3,000 feet. These mountains determine the watershed of the country. They intercept in great measure the rain clouds which drift from the south and east, and hence it is that the rainfall on the eastern slope averages from 50 to 60 inches per annum, while to the west of the Main Range it is uncertain, and often does not exceed 20 inches. The streams flowing eastward are comparatively small, and as they have but little fall, the adjacent valleys are subject to inundation in times of heavy rain. The Hawkesbury, the Clarence, and the Richmond are navigable for a distance of 50 miles and upwards, but not for ships of heavy tonnage. Tracts of country, more particular of the district of Illawarra, and along the banks of the northern rivers, were densely covered with forests of cedar and other woods of great economic value, while climbing vines, arborescent ferns, and stately palms also occurred in tropical luxuriance.

Mountain chains.

Rivers.

Products.

Ship building is carried on at the mouths of some of the rivers. Upon a large portion of the cleared lands lying between the mountains and the ocean maize, wheat, lucerne, and the sugar cane are cultivated, while the orange and the grape vine, the apple, peach, nectarine, plum, almond, banana, in nearly all their varieties, and many other edible fruits are grown in the vicinity of the towns, and reward the labour of the horticulturist with abundant crops. A considerable portion of the mountain country offers a tempting field for mining explorations. The rugged grandeur of much of it cannot fail to inspire feelings of admiration and even awe in the mind of the spectator; but its barrenness and comparative inaccessibility forbid the approach of the agricultural settler. There are, however, very extensive tracts of fertile soil upon the table land, and immediately to the west of it. The districts in which are situate Tumut, Young, Orange, Mudgee, Tamworth, and Armidale, are probably destined to become thickly peopled centres of farming industry. Wheat, oats, barley, and other cereals flourish in these regions; leaving the mountain heights and going westward, the forests give place to thinly-timbered country and treeless plains. This wide territory is watered chiefly by the Murray, the Murrumbidgee, the Lachlan, and the Darling rivers. The Murray is navigable for several hundred miles by steamers of very light draught of water, and during portions of the year they can run eastward up the Murrumbidgee as far as Wagga Wagga, and in a north-easterly direction up to the Darling as far as Bourke. The country towards the extreme west of the colony becomes very arid, the result of a diminishing rainfall and excessive evaporation. Nearly the whole of this territory, however, is now stocked with sheep and cattle which fatten upon the nutritive properties of the saline herbage, even after the grass has been burnt up by the parching heat of summer. The mean temperature of Sydney, which is centrally situated on the coast, is 62·4, the variation in the annual temperature being only from 59·8 to 64·3, a difference of 4·5, as compared with 8·0 in London; and the extreme range of the shade thermometer at Sydney is from 106·6 to 36·0, or 70·6, while in London it is from 97·0 to 5·0, a difference of 92·0. The climate of Sydney resembles very nearly that of Lisbon or Naples, the extremes of heat and cold being 5° less at Sydney than at Naples. It is thought that the equable temperature which prevails along the coast region of New South Wales is partly owing to the influence of the warm ocean current which flows in a southerly direction, parallel with the coast, and at a distance of four or five miles from it. The number of days on which rain falls at different places along the eastern slope averages from 100 to 150 in the year.

Climate.

Proportion.

The proportion of persons of British or foreign origin born in the colony was 61 per cent. of the total population.

Population.

The population of New South Wales at the close of 1875 was estimated at 606,652. The last census was taken in the year 1871, when the population was 503,981, of whom more than 96 per cent. were born in Great Britain or in the colonies, of British parents. The inequality of the sexes, which is apt to exist in all newly-settled countries, is every year becoming less observable in New South Wales. The males at the last census were 275,551, and the females 228,430. Of the total population 41·71 per cent. were under the age of fifteen, 56·17 per cent. were between the ages of 15 and 65 years, which ages are thought to correspond with 20 and 60 respectively in the United Kingdom; and 2·12 per cent. were older than sixty-five. It will thus be seen that out of every 10,000 persons comprising the population at the date of the last census, 5,620 would be classed as producers, and 4,380 as non-effective. With the growth of the community, and the increase of family life, it is found that the proportion of non-effectives, a class largely consisting of infants, increases; and that the relative proportions of these classes more nearly resemble those of England than was the case a few years ago. Were New South Wales to become as densely peopled as England is, the colony would contain upwards of 100,000,000 inhabitants. There is a strong tendency in the population to concentrate upon towns, more so than is the case in older countries. In 1871 the inhabitants of towns and villages numbered 234,162, and of the rural districts 267,417, while of the total population it was found that 134,736, or 26·73 per cent. were resident in Sydney and its suburbs. The average density of the population in the settled districts was 9·37 persons to the square mile. Including the whole

Density of population.

area of occupied country it was only 1·64, while in the county of Cumberland the returns show an average of 105·39 to the square mile. The number of dwelling-houses was 93,690, the proportion of occupants being 5·11 to each. In England the summer months are most prolific in births, and the winter months most fatal to life; but in New South Wales the greatest number of births occur in the winter, and of deaths in the summer quarter of the year. The ratio of marriages in 1874 to every one thousand persons living was 7·60, of births 38·87, and of deaths 15·16. The deaths of children under five years of age amounted to 43·85 per cent. of the total mortality. The educational returns of the last census showed that 70·33 per cent. of the population could read and write, that 12·94 per cent. could read only, and that 16·73 per cent. were wholly illiterate.

Rate of mortality.

Much of the progress of New South Wales is due to the suitability of the climate for the production of fine wool, and the pastoral industry still contributes more largely to the support of manufactures and the extension of commerce than any other. The narrow tract lying between the sea and the mountains is better adapted for depasturing long coarse woolled sheep, and there the Lincoln, Leicester, and Cotswold breeds are found. The table shows the proportion of the different breeds. The process of acclimatisation has modified the type of the Spanish Merino. There has been a decided gain in the softness of the wool and an improvement in its elasticity; but, while it has increased in length, it has diminished in density, so that the weight of the fleece remains about the same. The increase of the Merino sheep has been great and continuous; and, having much variety of soil and climate, New South Wales can produce in perfection all the different kinds of wool which manufacturers may require—from the very finest clothing suitable for broadcloths to the silky lustrous combing wool now in demand for the production of merinos, delaines, and other delicate fabrics. Nearly one half the total number of sheep in Australia are depastured within the limits of New South Wales, and, estimating the average weight of washed wool at 3 lbs. per fleece, the clip of New South Wales flocks for 1876 would amount to 73,147,608 lbs. Sixty-three samples of fine wool and one sample of Angora goat's hair were shown in the New South Wales Court at the Exhibition. The former were classified in their order of fineness of staple; the earlier numbers being from sheep bred in the western slopes of the Main Dividing Range, and the latter from sheep fed upon the more succulent herbage of the interior plains, showing the deeper growth and stronger staple which those pastures tend to produce. The limit of possible production has not yet been reached. The increase has been threefold during the last decade; and an experienced pastoralist estimates that with favourable seasons and a continuance of remunerative prices for wool in the English market, the flocks of New South Wales ten years hence will reach an aggregate of from forty to fifty millions. Official returns of live stock show that on the 31st of March 1876 there were 357,696 horses, 3,134,086 horned cattle, and 24,382,536 sheep. The Customs returns for 1874 state that the exports of the principal pastoral products—wool, live stock, preserved meats, hides, and leather—amounted in value to upwards of 6,200,000*l*.

Sheep breeding.

Breeds.

Modification of Merino breed.

Proportion of sheep in colony.

Official returns.

Among the vegetable products and manufactures exhibited were wheat and flour, maize and maizena, arrowroot, farm seeds, wine, sugar, oranges, and preserved fruits. All the different branches of husbandry followed in Europe may be carried on under equally favourable conditions in New South Wales, and some parts of the colony are fitted for the growth of semi-tropical products. Snow is of rare occurrence excepting in the Southern Alps and occasionally upon the mountain plateaux; and, viewing the colony as a whole, there are few localities in which it is absolutely necessary that live stock should be housed, or that special provision should be made to feed them during the winter months. One of the chief hindrances to agriculture has lain in the cost of transporting produce from lands in the interior to the seaboard. Railways have now been made to the verge of districts considered most suitable for the growth of cereals; and it may be expected, therefore, that additional impetus will be given to the cultivation of the soil. The average production of wheat is about twenty bushels to the acre, and of maize about thirty bushels; 60 lbs. to 64 lbs. per bushel are not unusual weights for wheat, and

Vegetable products.

Difficulties of transport.

from 60 lbs. to 66 lbs. for maize. As the roots of large trees are suffered to remain in the ground, the yield per acre over a large area of only partly cleared land must be proportionately less than in older countries where the whole arable surface is brought under tillage. In exceptionally fertile soils 120 bushels of maize have been obtained as a first crop, and with good farming an average of 60 bushels per acre can be secured in first class soils. The cultivation of the sugar cane is comparatively a new industry. It has been entered upon on the northern rivers; and on the Clarence one company has established three mills having an aggregate manufacturing capacity of seven thousand tons during the season. The produce of the crop for 1875 amounted to 15,355,648 lbs. Cotton has been grown, but has not proved remunerative; and while a large extent of country is suitable for the growth of tobacco, the manufacture of the home-grown leaf is not sufficiently well understood to enable the agriculturist to supersede the importation of foreign grown leaf, which brings the highest prices in the Australian markets. There is scarcely a district in which the grape vine does not flourish, and there is reason to suppose that the production of wine will become one of the great industries of the country. Dr. Lindemann remarks:—

“The soil and climate of many parts of New South Wales are eminently adapted to viticulture; from the Murray in the south to the Clarence in the north there are few places where the vine will not flourish, yielding wines in great variety and of rare quality. Many of the wines grown on the Murray are rich and alcoholic, surpassing in these qualities the wines of Portugal; while others with their soft luscious fulness and delicate flavour rival the first growths of the far-famed Constantia. Again, the wines grown upon the Hunter and more northern rivers are light, dry, and fragrant, bearing close resemblance to the sauternes, clarets, and burgundies of France. And there can be little doubt that the produce of the vine in the not very distant future will become a valuable export.”

The quality of the manufacture has steadily improved. The produce for 1875 was 684,258 gallons, and the total produce of the vineyards would include about 2,000 gallons of brandy, and upwards of 1,000 tons of fruit for home consumption and export to the adjoining colonies. The value of oranges exported exceeds 50,000*l.* per annum, and there is a large extent of country in which the cultivation of the citron has been most successful. The export of maize in 1874 exceeded one million bushels; and of wheat and flour the balance of imports over exports was of the value of 186,732*l.* The extent of land under cultivation on the 31st of March 1875 was 464,958 acres, and the extent enclosed (exclusive of pastoral holdings), but not cultivated, was 6,098,988 acres.

Two very excellent samples of silk cocoons were shown. Many varieties of the silkworm have been acclimatised, and the ailanthus and mulberry trees have become general. The experience which has been gained indicates that the colony possesses every climatic advantage requisite for the production of silk. Sericulture, however, cannot yet be said to exist as a colonial industry.

The geological survey of New South Wales has only recently been commenced, and it is not possible, therefore, to estimate otherwise than approximately the extent and value of her mineral deposits. Coal was the first mineral to attract attention. The approximate area of the carboniferous strata is estimated at 24,840 square miles. The principal coal beds exist along the coast to the north and south of Sydney. The mines first opened are situate in the immediate vicinity of Newcastle, and it is from these that the colony obtains its largest supply. The coal lies near the surface, and the greatest depth to which shafts have yet been sunk is less than 250 feet. In many districts the coal crops out on the face of the hills, and can be cheaply got by driving tunnels. The cost of mining is from 3*s.* to 5*s.* 6*d.* per ton. The coal shipping facilities at Newcastle are by staiths and steam cranes whose total loading capabilities have been increased to 12,300 tons per diem. Experiments with the New South Wales coal at the Royal Arsenal, Woolwich in 1858 and 1859 show that for steam purposes it was only seven per cent. inferior to the best Welsh coal; and that, as regards the manufacture of gas, it produces upwards of 9,000 feet per ton with an illuminating power twenty-four per cent. greater than the English variety known at Whitworth. The Government Director of the Indian Railway Companies in

Result of trials  
on Indian rail-  
ways.

his report to the Secretary of State for India (1868-9) refers to the quality of Australian coal. He says "It has been tried on some of the lines of " Western India and has been well reported on; the experience of the " Locomotive Superintendent of the Scinde Company is that 'it is equal to " 'Welsh coal in all respects, its evaporation power is nearly equal to Welsh " 'coal, and the consumption per mile is less.' The price hitherto has been " under that of English Welsh coal." The Government Examiner of Coal Fields (Sir John Mackenzie, F.G.S.) estimates that one seam of coal, after allowing one-third for loss and waste in getting, will yield 84,208,298,667 tons. It has been ascertained by the Rev. W. B. Clarke and the examiner of coal fields that there are in the upper coal measures at least sixteen seams of coal, each more than three feet thick. One seam, described by the late Mr. W. Keene, the outcrop of which is near Stroud, is more than thirty feet thick, as tested by several trial pits sunk on the dip side, and another, recently examined by Archibald Liversidge, Esquire, Professor of Geology in the University of Sydney, the outcrop of which is near Wallerawang, is seventeen feet six inches thick. The principal seam from which coal is now being obtained is from eight to ten feet thick, the coal being free burning and bituminous, suitable for house use, steam, smelting, gas, and black-smiths' purposes. Mr. R. W. Moody, a mining engineer, gives the following description of coal land on the south-eastern coast. "The five seams of coal " contained in this six hundred acres will yield 31,250,000 tons of coal, which " will supply a vend of one thousand tons a day for over one hundred years; " and this is independent of the exceedingly rich bed of kerosene oil shale, " which is sufficient to yield 2,000 gallons of refined oil per week, for over " seventy-two years. The position of all the seams is so favourably situated, " that the coal from each can be got by tunnelling into the mountain range, " and conveyed to the proposed railway terminus below, by self-acting inclined planes." Writing of the upper coal measures in the western district, the Government Geologist (C. S. Wilkinson, Esq., F.G.S.) says: "They are 480 feet thick, resting conformably on the marine beds of the " lower coal measures, and overlaid by more than 500 feet of Hawkesbury " sandstone. Eleven seams of coal have been counted in them. The " lowest, which is ten feet thick, lies about twenty-five feet above the " marine beds, and is the same seam worked by the Bowenfels, Eskbank, " Lithgow Valley, and Vale of Clwydd collieries. This seam of coal crops " out on the surface on the railway line near Bowenfels. It dips at a low " angle of three to five degrees to the north-east, and is, therefore, easily " worked; and as it passes under the vast extent of mountain ranges to " the north and east, it will be inexhaustible for generations to come." The production of coal has increased very rapidly of late years. In 1833, 328 tons were raised; and in 1874, 1,304,567 tons, the value of the last-named year's production being 786,152*l*. Nearly 900,000 tons were exported to the other Australian colonies and New Zealand, to China, Japan, and India, Mauritius, New Caledonia, and San Francisco. Several seams of cannel coal have been found, and the produce of two of them is retorted for the manufacture of kerosene oil. Their thickness varies from two to five feet. The Hartley shale yields 160 gallons of crude oil or 18,000 cubic feet of gas per ton, with an illuminating power equal to forty candles. The total production of coal to December 31, 1874 was 12,387,279 tons, of the value of 6,655,328*l*., and of petroleum oil shale 96,141 tons, of the value of 261,414*l*. Sections of the coal seams worked in the northern, western, southern, and Hunter River coal fields were exhibited, and also samples from several of the seams of petroleum oil coal.

Approximate extent.

Export.

The weight of gold obtained to the end of 1874 was 8,205,232 ozs., of the value of 30,536,246*l*. Except in some few localities quartz veins have not been worked to a great depth, and the auriferous resources of the colony have scarcely been touched. Alluvial lands have, in some instances, been worked to a depth of 200 feet, and there are the strongest indications of deep beds in various parts where no attempt has been made to work them. Gold mining, as hitherto carried on, has been principally confined to the working of river beds and shallow alluvial claims. Extensive areas of country are known to be auriferous, and there is still ample scope for the remunerative employment of a large population in both alluvial and quartz mining. The

indifferent success which has often attended the working of quartz veins is largely attributable to ill-judged speculation, inexperience, and the absence of proper ore-separating and other mining appliances. The Rev. W. B. Clarke, referring to a recent visit to the western district, says that he "passed over many miles of country in which the rocks that belong to a golden area yet remain in their original condition, and will so remain until some fortunate adventurer stumbles by accident upon a tangible encouragement." The approximate area included within the boundaries of proclaimed gold fields is 13,650 square miles. Forty-six samples of gold from the northern, southern, and western gold fields, specimens of auriferous quartz, and a model representing the total production of gold in New South Wales were shown at the Exhibition.

**Tin.** The existence of tin in New South Wales was known for many years, but it was not until 1871 that any attempt was made to turn this mineral to account as a marketable commodity. The most extensive deposits of ore have been found in the northern portion of the colony, but tin has also been discovered in other districts. The value of the tin obtained in 1872 was 47,703*l.*, in 1873 the value amounted to 334,436*l.*, and in 1874 to 484,322*l.*, the total value of the production to that date being 886,461*l.* The ore has hitherto been obtained in the beds of watercourses, and is separated from the soil by sluicing. In some localities extremely rich deposits of drift tin have been found in the beds of ancient streams, at a depth of from 60 to 80 feet below the surface; but it more frequently happens that the overlying soil is only a very few feet in thickness. Valuable lodes or reefs have also been discovered and in some cases crushing machinery has been erected to extract the ore. The profits of tin mining have been greatly diminished by the reduced price of the metal consequent upon the large additional supply obtained from the Australian fields. The tin bearing granites of New South Wales belong to the same geological era as those of Derwent and Cornwall. Specimens were forwarded to Dr. David Forbes, who stated that they were "perfectly identical with the stanniferous granites of Cornwall, Spain, Portugal, Bolivia, Peru, and Malacca." Warden Buchanan reports that many years will elapse before the ground now being worked will be exhausted, and says he is convinced that the tin fields open a wide scope for the employment of the labouring classes. The specimens of tin ores exhibited in the New South Wales Court were very numerous, and showed all the different forms in which the mineral has been found in the colony. The approximate area of the tin fields is 6,250 square miles.

**Copper.** There are several lodes of copper in New South Wales, but some of the richest are at present beyond the reach of railway communication. Those which have been hitherto worked vary in thickness from one to five feet. Analyses show that they contain from seven to twenty per cent. of metal, and that the copper is not unfrequently associated with gold, silver, lead, and sulphur. The production of copper has increased in value from 1,400*l.* in 1858 to 156,626*l.* in 1873. The export of copper for the year 1874 was valued at 311,519*l.*, but it probably included a portion of the product of South Australian mines sent to Newcastle to be smelted.

**Iron.** Important deposits of iron ore are found in close proximity to coal and limestone in various parts of the colony. Attempts to make iron at a profitable rate have failed. It is thought, however, that the financial failure of these experiments has arisen from preventible causes, and it is expected that the demand for iron in the colony will be supplied by metal locally produced.

**Various samples.** *Hæmatite*, *magnetic*, *chrome*, and other iron ores were shown in the mineral collection. The ore found at Mittagong in the southern district contains about 66 per cent. of iron. Speaking of the deposits of iron ore at Wallerawang, Professor Livingside says:—"They contain two varieties of iron ore, *magnetite*, or the *magnetic oxide of iron*, and the brown *hæmatite* or *goethite*—the *hydrated oxide*; then, in addition to these, there are deposits of the so-called *clay band* which are *interstratified* with the coal measures. These *clay bands* are not what are usually known as *clay iron ores* in England; they are brown *hæmatites*, var *limonite*, while the English *clay iron ores* are *impure carbonates of iron*, which seldom contain much more than thirty per cent. of *metallic iron*, against some fifty per cent. contained by the *hæmatites*. A highly *ferruginous garnet* accompanies the veins of *magnetite*; this garnet

“ is very rich in iron, and it will probably be found advantageous to smelt it with the other ores, not only on account of the large per-centage of metal which it contains, but also on account of the increased fluidity it would impart to the slag.”

In view of the smallness of the population, and its dispersion over a wide area, the manufacturing activity of the people of New South Wales is necessarily confined to articles which can be produced without much sub-division of labour, and for which there is a large demand. The first industries commenced were those which naturally arose out of the conditions of settlement, and were largely dependent upon pastoral and agricultural pursuits for the facility and success with which they could be carried on. Manufactures of this class were the flour mills, wool washing establishments, and tanneries; with the increase of the people and the multiplication of dwellings there has been a corresponding development in industries connected with building; the requirements of a growing commerce have called into existence extensive engineering and ship building establishments; and the activity in mining has resulted in the erection of many quartz mills for extracting gold, in the construction of smelting and blast furnaces for the reduction of tin, copper, and iron ores. Manufactures of leather have attained to a high degree of excellence, and the production of woollen goods may be expected to assume great dimensions. Richly endowed with coal and iron, “the main factors in all recent progress,” New South Wales may aspire to a position of manufacturing preëminence in the southern hemisphere. There are many skilled artificers in the community competent to construct locomotive engines, steam ships, and other important works which demand for their production considerable technical ability on the part of the operatives in wood and iron. The principal manufactures at the close of 1874 are enumerated in official returns as follows:—Agricultural implements 45, tobacco 23, home manure 10, sugar 67, maizena and starch 1, woollen cloth 8, soap and candle 31, tanners, &c. 104, fellmongers 35, salting and meat preserving 23, boiling down 33, wool-washing 33, steam ditto 10, glue 2, distillers 49, sugar refiners 6, breweries 31, confectionery 42, spice works 7, jam 3, ginger beer, aerated waters, vinegar, ink, blacking, &c. 99, brick 282, drain pipes 8, lime 104, pottery 13, tile works 11, steam saw mills, 140, machine manufactories, brass, lead, iron, and tin works 76, type foundries 2, account book 12, basket 3, bone charcoal 1, bedding 3, boot 50, brush 1, steam cabinet works 1, chemical 1, clothing 17, coach and waggon 99, comb 1, fire-works 1, gas 10, glass 3, hat 12, ice 4, mast and block 2, metallic paint 1, organ 1, paper 1, rope 6, railway carriage 3, salt 1, ship and boat 103, smelting iron 5, surgical instruments 1, wine 1, window blind 1. There has been a fourfold increase in manufacturing industry during the last ten years, while the augmentation of the population of the colony has been less than one half.

Manufacturing industry.

Sundry developments.

Prospects.

Sydney, the capital of New South Wales, is favourably situated for external commerce; and the development of trade has been more than commensurate with the increase of the people. In 1850, with a population of 265,503, the total value of the import and export trade of the colony was 4,477,918*l.*, while in 1874, a quarter of a century later, after Victoria and Queensland had been separated from the parent colony, the population had increased to 584,278, and the total trade to 23,639,342*l.*, being equal to 40*l.* 9*s.* 2*d.* per head. The imports for 1874 (the latest year in respect of which the compiler of this report has access to official Customs returns) were 11,293,739*l.*, or at the rate of 19*l.* 15*s.* 11*d.* per head of the estimated population at the middle of the year, and the exports 12,345,603*l.*, at the rate of 21*l.* 12*s.* 9*d.* per head. The imports of the last decennial period amounted to 87,229,173*l.*, and the exports to 78,270,358*l.* The aggregate real value of the trade was thus 165,499,531*l.*, but, large as these figures are in comparison with the population, they do not express the total value of the commerce of New South Wales, especially of her exports, for during three of the years included in the decennial period no record was kept of the overland export trade to Victoria, the value of which, during the portion of 1874 for which the account was kept, amounted to nearly three millions sterling. Of the total trade of the ten years ending 1874, which in round numbers may be set down at one hundred and sixty-five and a half million pounds sterling, 151,906,364*l.* is the value of the commodities exchanged between New South Wales on the one hand, and the United

Sydney.

Its population.

Trade.

Kingdom, the Australian colonies, and other British dependencies on the other. During that period, the colony purchased goods from Great Britain to the value of 36,317,960*l.*, and she supplied the manufacturers of the parent country with wool and other commodities, amounting in value to 40,539,604*l.* The total recorded value of articles, the produce or manufacture of New South Wales, exported during the decennial period was 56,047,961*l.* The actual value was considerably more, but from the incompleteness of the Customs records already referred to, it is not easily ascertained.

#### Shipping.

The maritime interests of New South Wales, as indicated by the tonnage of the ships built and owned by her merchants, is greater than that of any other Australian colony. The tonnage of ships built to the end of 1874 was 82,294, and of ships registered 101,008. Of the vessels owned in the colony 131 are propelled by steam. The number of ships which entered the ports of New South Wales in 1874 was 2,217, of the aggregate tonnage of 1,016,369, the outward bound ships numbering 2,168, and having a total tonnage of 974,525.

#### Railways.

Much of the internal commerce of the country converges upon the three principal lines of railway, which have been constructed by the government and are managed under their direction. The northern line starts from Newcastle and runs through the adjacent coal fields, and up the fertile valley of the Hunter to Murrurundi. The traffic of the western and southern centres upon Sydney. Diverging at Parramatta, they are each taken across the Nepean by stone viaducts of colossal proportions; and while the western road runs over the mountain range which it ascends near Penrith, and descends near Bowenfels by massive and ingenious engineering works, the southern intersects the dividing range through a steep pass near Mittagong. Each of these roads passes through country abounding in iron, coal, and other minerals; and in some portions of their course through extensive tracts of land well adapted for fruit growing and general farming purposes. Bathurst and Goulburn are the principal towns in the western and southern interior, and they are situated on the verge of valuable pastoral and agricultural country. By the end of 1876 the northern line will have been completed to Quirindi (148 miles), the western to Blaney (175 miles), and the southern to Murrumburrah (230 miles), making the total length of the railways opened for traffic 553 miles. Contracts for additional lengths have been taken, and it is the policy of the government to extend their railways as fast as the difficulty of obtaining labour will permit them to do, until the lines reach the northern, western, and south-western boundaries of the colony. The average number of miles of railway open during traffic in 1874 was 398, the number of passengers carried was 1,539,044, and the tonnage of merchandise 1,076,068.

#### Telegraphs

The electric telegraphs of the colony were also constructed by the government, and are managed by them. Every township of any trading importance has the advantage of telegraphic communication with the rest of the world, and there are also several stations on the coast used in connexion with the system of storm signals and for other maritime purposes. The cost of sending a telegram of ten words between any two places in the colony, however remote from each other they may be, is one shilling. There have been more than 8,000 miles of line constructed, and the number of telegrams forwarded from the 137 stations open in 1875 was 719,145. Telegraphic communication with the various towns in the other Australian colonies is equally available, and almost equally cheap. The line constructed through the centre of the continent to Port Darwin by the government of South Australia affords the means of communication with India and Europe, and the governments of New South Wales and New Zealand have, by the payment of annual subsidies procured the laying of a submarine cable connecting the two colonies which has been in successful operation during a large part of 1876.

#### Postal communication.

Postal facilities are still more widely extended. In 1875 there were 752 post offices, the mileage travelled by the postal conveyances was 3,787,757, over routes having an aggregate length of 17,670 miles. The postage on inland letters is 2*d.* the  $\frac{3}{4}$  oz., and newspapers are carried without charge. The number of letters carried during 1875 was 13,717,900, of newspapers 6,262,600, and of packets 357,000. Three separate lines of mail steamships establish regular and frequent communication with the United Kingdom, the service by the way of San Francisco being subsidised by the governments of New South Wales and New Zealand, that *viâ* Torres Straits by Queensland, and that *viâ* Galle by Victoria.

There were ten banking companies carrying on business in New South Wales during the last quarter of 1874. Their total liabilities were 13,206,359*l.*, and their assets 17,030,330*l.* Their liabilities were, notes in circulation, 1,053,108*l.*; bills in circulation, 36,792*l.*; balances due to other banks, 231,499*l.*; and deposits, 11,884,957*l.* Their assets were, coin, 2,351,693*l.*; bullion, 255,960*l.*; landed property, 324,171*l.*; notes and bills of other banks, 45,453*l.*; balances due from other banks, 3,367,791*l.*; notes and bills discounted, and all other debts due, 10,685,250*l.* Their paid-up capital amounted to 7,894,656*l.*; the amount of their dividends for the year, 485,719*l.*, and of their reserved profits at the time of declaring such dividends, 2,346,730*l.* The amounts at the credit of 37,606 persons in the savings banks of the colony on the 31st of December 1874 was 1,579,015*l.*, or at the rate of nearly 42*l.* to each depositor. The amount of coin and bullion held by the banks and the mint on the 31st of December 1874 was 2,522,533*l.*, and the total amount coined at the Sydney Branch of the Royal Mint at that date was 35,857,000*l.*

The wages of carpenters, smiths, wheelwrights, bricklayers, masons, and most other skilled workmen has during the last ten years ranged from 8*s.* to 12*s.* per diem of eight hours. For farm labourers 30*l.* to 35*l.* a year with board and lodging is the average wage, and the earnings of domestic servants vary from 26*l.* to 40*l.* The average prices of the following commodities during the year 1874 were, wheat, 5*s.* 6*d.* to 6*s.* 6*d.* per bushel; bread (first quality), 1½*d.* to 2*d.* per lb.; flour (first quality), 1½*d.* to 1¾*d.* per lb.; rice, 2½*d.* to 3*d.* per lb.; tea, 1*s.* 2*d.* to 2*s.* 6*d.* per lb.; sugar, 3½*d.* to 4½*d.* per lb.; fresh meat, 3½*d.* to 4½*d.* per lb.; fresh butter, 1*s.* 7*d.* per lb.; cheese, 6*d.* per lb.; potatoes, 4*s.* to 5*s.* 6*d.* per cwt.; soap, 2½*d.* per lb. These are the prices for Sydney. Of the whole colony it may be affirmed that work is easily to be obtained, that wages are generally high, and that the cost of living is almost uniformly cheap.

Rates of wages.

Price of commodities.

The forms of municipal and parliamentary government have been modelled on those of England, and it is the aim of colonial statesmen to keep representative government in New South Wales in harmony with the spirit as well as the procedure of the House of Commons. Justice is impartially administered throughout the colony, and public schools, chiefly supported by parliamentary appropriations, are also general. In the alienation of the waste lands it has been the policy of Parliament to facilitate the acquisition of homesteads by persons of small means who desire to occupy the soil for agricultural or mining purposes, land not so required being left in the occupation of the pastoral settler at a nominal rental. The total area of land alienated prior to 1874 was less than twenty million acres, leaving upwards of 180,000,000 acres which may still be purchased, excepting such portions as have been reserved for the preservation of timber and other public uses. The upset price of land is 1*l.* per acre, and that also is its absolute price when taken up for agricultural operations under conditional purchase. It is competent for any person over sixteen years of age to select any unsold and unreserved government land, either before or after survey, in a block of not less than forty acres nor more than 640 acres, upon the payment of 5*s.* per acre, the balance of the purchase money to be paid at the expiration of three years in instalments of not less than 1*s.* per acre per annum, these instalments being a liquidation of the interest at five per cent. as well as in payment of the principal sum. The land is sold under conditions of residence and improvement by the purchaser. Mineral lands may be leased from the government at the annual rental of 5*s.* per acre, for a term of 20 years, renewable at the option of the lessee, or they may be bought at 2*l.* per acre, the purchaser covenanting to spend a like amount in improvements within three years. The revenue of the colony for the year 1874 amounted to 3,509,966*l.*, the rate per head of taxation being 2*l.* 1*s.* 8*d.* The principal sources of revenue were the customs, which yielded 951,233*l.*, the sale, rent, and interest of land 1,426,166*l.*, and railway and postal receipts 635,722*l.* The Customs tariff consists wholly of specific duties levied upon 55 articles, and New South Wales imposes less restrictions upon trade than exist under the fiscal system of any other Australian colony. The public debt amounted to 10,516,371*l.* on the 31st December 1874, being at the rate of 17*l.* 19*s.* 11*d.* per head of the population. This indebtedness was incurred for the construction of railways, electric telegraphs, breakwaters, and other public improvements. Of these the railways and the telegraphs are largely reproductive,

Government.

Land laws:

For agricultural operations.

For mineral lands.

Revenue.

Customs tariff.

Public debt.

Concluding  
remarks.

and it is expected that they will eventually return a profit upon the capital borrowed for their construction.

Subjoined is an enumeration of the principal articles forwarded to the International Exhibition. The Commissioners are aware that the difficulties attending a complete representation of the products of the soil and mine, and of the arts and industries of New South Wales were not fully overcome in the display which was made on the part of the colony in the International Exhibition which has just been closed. While untoward circumstances, other than those inseparable from the transportation of goods for a distance of twelve thousand miles by a route which involved five transshipments, combined to prevent the full realisation of their aims, still they feel that the liberality of Parliament and the public spirit of individual exhibitors enabled them to present in a suitable manner a view of the great wealth of the country in coal, iron, tin, copper, gold, and other mineral products; to show the capability of its pasture for the production of fine wool; and to exhibit the fertility of its soil and the great range of its climate as exemplified by the unequalled collection of forest woods, the samples of fruit, wheat, maize, wine, sugar, and other products of temperate and semi-tropical zones. They are very sensible of the appreciation and interest manifested by visitors to the Exhibition, and by none more than by the American people, in the progress of Australian colonisation, and they have not been unobservant of the material advantages which may spring from the more intimate relations into which the United States and Australia have been brought. They have, however, desired especial gratification from the association of New South Wales with the other dependencies of Great Britain which have co-operated with the parent country at the celebration of the one hundredth anniversary of American Independence; and they trust that the unity which has existed at this representative gathering of the nations will be influential in intensifying those sentiments of loyalty and affection which happily exist between the United Kingdom and her colonies, and in binding together in enduring concord all the widely separated portions of the empire.

CHARLES ROBINSON,  
Secretary.





CATALOGUE of the PRINCIPAL EXHIBITS sent by the COMMISSIONERS  
for NEW SOUTH WALES to the INTERNATIONAL EXHIBITION,  
PHILADELPHIA, 1876.

*P signifies Award for Exhibit.*

(The Government of New South Wales received an award for Collective Exhibit.)

(The Commissioners for New South Wales received also two awards for barks and woods from trees indigenous to the Colony.)

MINERALS, ORES, BUILDING STONES, AND MINING PRODUCTS.

CLASS 100.

*P* Collection of Ores and Associated Minerals, illustrative of the Mineral Resources of New South Wales. Exhibited by Department of Mines, Sydney. [For gold and copper ores.]

COPPER ORES.

- Carbonates and sulphide of copper. Three Mile Flat, near Wellington. Assay 13·15 per cent. copper.
- Carbonate of copper (auriferous). 13 miles north-east of Wellington.
- Carbonates of copper. Gordon Brook, Clarence River.
- Copper ingot. Goodrich Copper Mine.
- Red oxide and carbonate of copper. Mount Hope, Lower Lachlan.
- Sulphide of copper. Wellbank, 4 miles south of Wellington. Assay, 13·39 per cent. copper.
- Sulphide of copper. Wellbank, 4 miles south of Wellington. Assay, 13·39 per cent. copper.
- Carbonate of copper. Mitchell's Creek. Assay, 12·57 per cent. copper, gold equal to 1 oz. 2 dwt. 20 grs. per ton.
- Native copper and red oxide. 10 miles north of Wellington. Assay, 8·76 per cent. copper.
- Sulphide of copper. Hurley and Wearne's Copper Mine, Wellington District.
- Sulphide of copper. Hurley and Wearne's Copper Mine, Wellington District.
- Sulphide of copper. Goodrich Copper Mine, Wellington District.
- Carbonate and sulphides of copper. Cadumbe Range, 4 miles west of Newrea. Assay, 1·98 per cent. copper.
- Carbonate of copper. Mitchell's Creek. Assay, 9·48 per cent. copper, gold equal to 4 oza. 10 dwts. 8 grs. per ton.
- Carbonate of copper. Mitchell's Creek. Assay, 25·79 per cent. copper, gold equal to 14 ozs. 10 dwts. 6 grs. per ton.
- Native copper, red oxide, and carbonate of copper. Wellington.
- Carbonates of copper. Goodrich Copper Mine, Wellington District.
- Sulphides of copper, at depth of 88 feet. 10 miles north of Wellington.
- Red oxide and carbonate of copper. Cadumbe Range, county of Gordon.
- Red oxide of copper. Belara Copper Mine, 20 miles from Gulgong. Assay, 39 per cent. copper.
- Sulphide and carbonate of copper. Jones' Mount, Tuena.
- Red oxide of copper (ferruginous). Belara Copper Mine, 20 miles from Gulgong. Assay, 30 per cent. copper.
- Carbonate of copper. Bobby Whitlow Copper Mine, Bingera.
- Carbonate of copper, at depth of 87 feet. Belara Copper Mine, 20 miles from Gulgong.
- Red oxide of copper. Bobby Whitlow Copper Mine, Bingera. Assay, 19·94 per cent. of copper.
- Black oxide and sulphide of copper. Bobby Whitlow Copper Mine, Bingera.
- Red oxide and carbonate of copper. Bobby Whitlow Copper Mine, Bingera.
- Native copper and red oxide, at depth of 40 feet. Peabody Copper Mine, county of Ashburnham.
- Sulphide of copper. Narragal, county of Gordon.
- Carbonate and sulphide of copper. Hurly and Wearne's Copper Mine, Wellington District.
- Native copper. Hurley and Wearne's Copper Mine, Wellington District.
- Sulphide and red oxide of copper. Belara Copper Mine, 20 miles from Gulgong. Assay, 40·4 per cent. copper.
- Metallic Copper. Extracted by Hunt and Douglass new process, from copper ore, from the Goodrich Copper Mine.
- Native copper. Belara Copper Mine, 20 miles from Gulgong.

- Carbonate and sulphide of copper. Belara Copper Mine, 20 miles from Gulgong. Assay, 25 per cent. copper.
- Black oxide of copper. Belara Copper Mine, 20 miles from Gulgong. Assay, 40 per cent. copper.
- Sulphide of copper. Near Bingera. Assay, 19·94 per cent. copper.
- Red oxide and carbonate of copper. Bobby Whitlow Copper Mine, Bingera.
- Sulphide and carbonate of copper. Bobby Whitley Copper Mine, Bingera.
- Red oxide and carbonate of copper. Great Western Copper Mine, Milburn Creek, near Bathurst.
- Red oxide and carbonate of copper. Frog's Hole, parish of Bala.
- Sulphide of copper. Frog's Hole, parish of Bala.
- Sulphide of copper. Solferino.
- Carbonates of copper. Cow Flat Copper Mine, near Bathurst.
- Sulphides of copper, with galena. Cow Flat Copper Mine, near Bathurst.
- Carbonates of copper. Frog's Hole, parish of Bala.
- Sulphide of copper. Cow Flat Copper Mine, near Bathurst.
- Red oxide and carbonate of copper. Great Western Copper Mine, Milburn Creek, near Bathurst.
- Sulphides of copper. Milburn Creek Copper Mining Company, near Bathurst.
- Sulphide of copper, with galena. Wiseman's Creek, near Bathurst. Assay, 11·30 per cent. copper.
- Sulphide of copper, with galena. Wiseman's Creek, near Bathurst. Assay, 11·30 per cent. copper.
- Carbonates of copper. Wiseman's Creek, near Bathurst. Assay, 16·72 per cent. copper.
- Red oxide and carbonate of copper. Cow Elat Copper Mine, near Bathurst.
- Red oxide and carbonate of copper. Apsley. Assay, 18·72 per cent. copper.
- Sulphides of copper. Cow Flat Copper Mine, near Bathurst.
- Sulphide of copper. Between Condoblin and Parkes.
- Native copper, red oxide and carbonate of copper. Between Condoblin and Parkes.
- Sulphide of Copper. Armstrong Copper Mine, near Bathurst.  $\left\{ \begin{array}{l} \text{Copper, 18 per cent.} \\ \text{Gold, 7 dwts. per ton.} \\ \text{Silver, 3 ozs. per ton.} \end{array} \right.$  Assay :—
- Red oxide and carbonates of copper. Armstrong Copper Mine, near Bathurst. Assay, 33 per cent. copper.
- Carbonate of copper. Armstrong Copper Mine, near Bathurst. Assay, 28·7 per cent. copper.
- Sulphide of copper. Molong.
- Carbonates of copper. Armstrong Copper Mine, near Bathurst. Assay, 21·5 per cent. copper.
- Carbonates of copper. Wiseman's Creek, near Bathurst.
- Red oxide of carbonate of copper. South Wiseman's Creek, near Bathurst. Assay, 27·06 per cent. copper.
- Ironclad Reef. Cargo. Assay, 23·16 per cent. copper.
- Carbonate of copper. Copabella, Southern District.
- Sulphide of copper, with galena. South Wiseman's Creek, near Bathurst. Assay, 28·75 per cent. copper.
- Red oxide of copper, at depth of 30 fathoms; lode 4 feet thick. Peelwood, 10 miles south of Tuena.
- Carbonates and red oxide of copper. Apsley. Assay, 22·82 per cent. copper.
- Carbonates and sulphides of copper. Apsley.
- Sulphides and black oxide of copper. Apsley. Assay, 18·72 per cent. copper.
- Carbonate of copper. Armstrong Copper Mine, near Bathurst.
- Carbonate of copper. Armstrong Copper Mine, near Bathurst. Assay, 36·4 per cent. copper.
- Sulphide of copper. Armstrong Copper Mine, near Bathurst. Assay, 32·7 per cent. copper.
- Sulphide and black oxide of copper. South Wiseman's Creek, near Bathurst.
- Carbonates of copper. South Wiseman's Creek, near Bathurst.
- Sulphide of copper. Gordon Brook, Clarence River.
- Red oxide and carbonates of copper. Wiseman's Creek, near Bathurst.
- Red oxide and carbonates of copper. Gordon Brook, Clarence River.
- Sulphide of copper. Jacqua Copper Mine. Narrimunga.
- Sulphide of copper. Peelwood, 10 miles south of Tuena. Assay, 21·38 per cent. copper.
- Red oxide and carbonates of copper, at depth of 40 fathoms. Peelwood, 10 miles south of Tuena. Assay, 49·27 per cent. copper.
- Carbonate of copper, at depth of 20 fathoms. Peelwood, 10 miles south of Tuena.

## AURIFEROUS QUARTZ.

- Auriferous quartz. Mitchell's Creek, near Wellington.  
 Do. Wilson's Line, King of the West Company. Trunkey.  
 Do. from depth of 120 feet. Pembroke Reef, 6 miles from Trunkey.  
 Do. with iron pyrites. United Miner's Snob's Reef, near Braidwood.  
 Do. with iron pyrites. Spring Creek, near Braidwood.  
 Do. with iron pyrites. Pioneer Line of Reef; depth 240 feet. Trunkey.  
 Do. at depth of 70 feet. No. 4, North Garibaldi Reef, Solferino.  
 Do. with iron pyrites. 50 feet. Star Reef, Solferino.  
 Do. with iron pyrites. 100 feet. Lombardy Reef, Solferino.  
 Do. with iron pyrites. 65 feet. Laird and Bacon's Lease, Solferino.  
 Do. reef, 2 feet thick, Major's Creek, near Braidwood.  
 Do. Spa Reef, Nerrimunga.  
 Do. with sulphurets of iron, lead, and zinc. Snob's Claim, Big Hill, Major's Creek, near Braidwood.  
 Do. near Forbes.  
 Gold in cleavage planes of clay slate, sandstone reef. Cowarbee, Murrumbidgee District.  
 Auriferous quartz. Prospectors' Band of Hope Reef, Solferino.  
 Do. with iron pyrites. Victoria Reef, Adelong. Yield, 5 ozs. gold per ton.  
 Do. at depth of 50 feet. Gilmandyke, 12 miles from Trunkey. Yield, 1 oz. gold per ton.  
 Gold in brown iron ore. Lucknow Gold Field, Frederick's Valley.  
 Auriferous quartz, reef 1 foot thick, depth 40 feet. Louisiana Reef.  
 Do. at depth of 80 feet, No. 1 North Lion Reef, Solferino.  
 Do. at depth of 50 feet. Southern Cross Reef, Solferino.  
 Do. with iron pyrites. Spring Creek, near Braidwood.  
 Do. with large cubical crystals of iron pyrites, at depth of 50 feet. Snob's Claim, Big Hill, Major's Creek, near Braidwood.  
 Do. at depth of 50 feet. Mac's Reef, Gundaroo.  
 Do. at depth of 80 feet. Gulgong.  
 Do. at depth of 30 feet. Kearns, White, and party's, No. 4, Sucks-all Reef, Oberon.  
 Do. William the First Reef, Nerrimunga.  
 Do. Prospecting Claim, Manton's Reef, Nerrimunga.  
 Do. Eureka Claim, Nerrimunga.  
 Do. at depth of 300 feet. Trunkey Creek Quartz Mining Company, Trunkey.  
 Do. Grove Creek, 10 miles from Trunkey.  
 Do. at depth of 500 feet. Trunkey.  
 Do. at depth of 70 feet. Arthur's Line of Reef, Trunkey.  
 Gold in quartz. Easter Gift Reef, Crow Mountains, near Barraba.  
 Auriferous quartz. Kangaroo Reef, Nerrimunga.  
 Do. near Forbes.  
 Do. at depth of 20 feet. Pride of Clarence Reef, Solferino.  
 Auriferous Porphyry Dyke, 15 yards wide, at depth of 67 feet, near Forbes.  
 Auriferous quartz, at depth of 100 feet. Old Gulgong Reef, 4 miles from Gulgong.  
 Do. at depth of 120 feet. Prospecting Claim, Manton's Reef, Nerrimunga.  
 Do. at depth of 130 feet. Welcome Reef, near Gulgong.

## TIN ORES.

- Stream tin. Tent Hill, near Vegetable Creek.  
 Do. Vegetable Creek Tin-mining Company, O'Daly's Mine, Vegetable Creek.  
 Do. Little Britain Tin Mine, Vegetable Creek.  
 Do. Rothschild's Mine, Vegetable Creek.  
 Do. Boro Creek, Tumbarumba.  
 Do. Vegetable Creek Tin-mining Company, O'Daly's Mine, Vegetable Creek.

- Stream tin. Ancient Briton Tin Mine, Middle Creek, near Inverell.  
 Do. Speare's and Moore's Tin Mine, Vegetable Creek.  
 Do. Wylie Creek, New England. Assay, 74·4 per cent. tin.  
 Do. Rain's Gully, Gulf Creek.  
 Do. Great Britain Tin-mining Company, Vegetable Creek.  
 Do. P. Sexton and Co., Yellow Waterholes, Vegetable Creek.  
 Do. Head of Ruby Creek.  
 Do. Glen Creek Tin mining Company, Glen Creek.  
 Do. Baal Gammon Tin Mine, Vegetable Creek.  
 Do. Hall, Bros., and Co., Kangaroo Flat, Strathbogie Run, near Vegetable Creek.  
 Do. Hall, Bros., and Co., The Springs, Strathbogie Run, near Vegetable Creek.  
 Do. Main Range, between Herding Yard and Ruby Creeks.  
 Do. Herding Yard Creek.  
 Do. Yellow Waterholes, near Vegetable Creek.  
 Do. Deepsinker's Mine, Vegetable Creek.  
 Do. M'Master's Mine, Tent Hill.  
 Do. Gordon's Tin Mine, Vegetable Creek.  
 Do. Hall, Bros., and Co., Vegetable Creek Mine, Vegetable Creek.  
 Do. Little Wonder Tin Mine, Vegetable Creek.  
 Do. Victoria Tin Mine, Cope's Creek.  
 Do. Hall, Bros., and Co., Grampian Hills, near Vegetable Creek.  
 Tin ore shoad stones. Grampian Hills, Vegetable Creek.  
 Stream tin. Ruby Creek, New England. Assay, 76 per cent. tin.  
 Do. Hogue's Creek, Dundee.  
 Do. Wylie Creek, New England.  
 Do. Oban, New England.  
 Cassiterite (alluvial). Deepsinker's, the Gulf, New England. From Mr. G. H. Butchart.  
 Stream tin. Bengonoway Tin Mine, Borah Creek, near Cope's Creek.  
 Do. Britannia Tin Mine, Cope's Creek.  
 Cassiterite. "Toad's-eye" tin, Grenfall.  
 Stream tin. Glen Creek.  
 Do. Sydney Tin Mine, Middle Creek, near Inverell.  
 Do. Pine Ridge Tin Mine, Cope's Creek, near Inverell.  
 Do. Wearne's Tin Mine, Cope's Creek.  
 Do. Pride of the Ranges Tin Mine, Auburn Vale, near Inverell.  
 Grain tin. Australian Tin Smelting Company, Sydney.  
 Stream tin. Pine Ridge Tin Mine, Cope's Creek, near Inverell.  
 Do. near Maryland, Queensland Border.  
 Black sand. Lady Emily Tin Mine, Cope's Creek.  
 Stanniferous wash dirt. Head of Pond's Creek, near Inverell.  
 Stream tin. Great Britain Tin Mine, Vegetable Creek.  
 Do. Gulf Tin Mining Co., Gulf Creek.  
 Do. Glen Creek.  
 Crystallized tin. Pyrmont Tin Smelting Works, Sydney.  
 Stream tin. Campbell's Mine, Vegetable Creek.  
 Do. Range between Wylie and Bookookoorara Creeks, New England.  
 Pebbles from Older Tertiary Drift, Stannifer Tin Mine, Middle Creek, near Inverell.  
 Stream tin. Bald Rock Creek.  
 Do. Robert's Tin Mine, Long Gully, Cope's Creek.  
 Lode tin. Riley and Cohen, Tent Hill, New England.  
 Do. Elder and Co., Graveyard Creek.  
 Do. Glen Creek.  
 Do. M'Donald's Lode, Glen Creek.  
 Do. Bolitho Tin Mine, near Cope's Creek.  
 Stanniferous wash dirt. Britannia Tin Mine, near Inverell.  
 Tin ore (cassiterite) in quartz. Glen Creek.  
 Lode tin, from the Mole Tableland, near Tenterfield.  
 Lode tin, from the Mole Tableland, near Tenterfield.  
 Tin ore (cassiterite) in quartz. Tent Hill, Vegetable Creek.  
 Lode tin. M'Master's Lode, Tent Hill.  
 Do. Graveyard Creek, near Vegetable Creek.  
 Do. Moonbah Ranges, near Snowy River, 40 miles from Cooma, three lodes from 1 to 2 feet wide, strike north and south.  
 Do. Cope's Creek, near Inverell.  
 Do. Bolitho Tin Mine, Cope's Creek.

- Stanniferous wash dirt. Arden's Mine, Tent Hill.  
 Do. O'Daly's Tin Mining Co., Vegetable Creek.  
 Do. Great Britain Tin Mining Co., Vegetable Creek.  
 Stream tin. Britannia Mine, Cope's Creek.  
 Lode tin. Myall Creek, near Bingera.  
 Do. Thompson and Burrage's Tin Mine, Sutherland's Water, Cope's Creek.  
 Do. Bismarck's Mine, Cope's Creek.  
 Do. Tenterfield.  
 Do. Butchart Tin Mine, Cope's Creek.  
 Older Tertiary (Miocene) drift, tin-bearing. Stannifer Mine, Inverell.  
 Stanniferous wash dirt. Lady Emily Mine, Cope's Creek.  
 Do. cement. O'Daly's Mine, Vegetable Creek.  
 Do. wash dirt. Karaula Tin Mine, near Inverell.  
 Do. cement. Rose Valley Mine, Vegetable Creek.  
 Lode tin. Elsmore Tin Mine, New England.  
 Do. Mowamba, County Wallace, Monaro District.  
 Do. Butchart Tin Mine, Cope's Creek.  
 Do. From the Mole Tableland, near Tenterfield.  
 Do. Hit-or-Miss Tin Mine, near Cope's Creek.  
 Grain tin. Pyrmont Tin Smelting Works, Sydney.  
 Lode tin. Canning and Hutton's, Sutherland's Water, Cope's Creek.  
 Tin ore. Cassiterite, with fluor-spar in quartz, Boundary Tin Mine, Cope's Creek.  
 Quartz crystals, enclosing crystals of cassiterite. Albion Tin Mine, Cope's Creek.  
 Lode tin. Elsmore Tin Mine, New England.  
 Do. The Mole Tableland, near Tenterfield.  
 Tin ores. Arthur Dewhurst, Tamworth.

#### VARIOUS MINERALS.

- Garnetiferous schist. Washpool Creek, Solferino.  
 Petrified wood. Castlereagh River, from Mr. T. Brown, M.L.A.  
 Asbestos. Wentworth, Lucknow Gold Field, from Mr. James Jackson.  
 Calcite. Lunatic.  
 Opal. Bland, near Forbes.  
 Opalized wood. Bloomfield, near Orange, from Mr. W. O'Halloran.  
 Talcosc schist. Upper Silurian, near Bathurst.  
 Dendrites in granite, near Mount Lambie, from Mr. T. Brown, M.L.A.  
 Schorl, from tin-bearing granite, Cope's Creek, New England.  
 Chalcedonic quartz. Andrew and Company's lode, 30 feet from surface, Tent Hill.  
 Herschellite in basalt. Inverell.  
 Metamorphic slate, Silurian. Sheppardtownton, Adelong Creek.  
 Granite. Wagga Wagga.  
 Gem sand. Diamond District, Two-mile Flat, Mudgee.  
 Sapphire. Rocky River.  
 Samples of drift, from Diamond Fields, Bingera.  
 Fluor spar and quartz, with sulphides of copper, lead, iron, and molybdenum in granite. Middle Creek, New England.  
 Serpentine, near Barraba.  
 Asbestos. Lewis Ponds Creek, Wellington.  
 Epidote. Old Gulgong Reef, Gulgong.  
 Quartz crystal, from carboniferous conglomerate. Coerwall, Bowenfels, from Mr. T. Brown, M.L.A.  
 Quartz crystals, Hill End, from Mr. T. Brown, M.L.A.  
 Calcite. Fish River Caves, from Hon. J. Lucas, M.L.A., Minister of Mines.  
 Quartz and mica, Devonian granite. Fish River, from Mr. T. Brown, M.L.A.  
 Carnelians. Big or Castlereagh River, from Mr. T. Brown, M.L.A.  
 Jasper, from vein in tertiary basalt. Newstead, New England.  
 Fragment of tree, two feet in diameter, embedded in basalt, Inverell.  
 Mica schist. Wagga Wagga.  
 Fluor-spar in Devonian beds, Mount Lambie.  
 Quartz crystals. Solferino.  
 Petrified wood. Castlereagh River, from Mr. T. Brown, M.L.A.  
 Obsidian stones. Rocky River.  
 Talc. Fish River, near Bathurst, from Mr. T. Brown, M.L.A.

Cinnabar. Sulphuret of mercury. Cudgegong.  
 Granite veins, intruding Devonian beds. Mount Lambie.  
 Porphyritic trap intruding carboniferous beds. Kiama.

#### IRON ORES.

Clay band, iron ore, brown hæmatite. From Upper Coal Measures, Jamberoo.  
 Clay band, iron ore, brown hæmatite. From Coal Measures, Lithgow Valley, Iron Company.  
 Ironstone. Below Hawkesbury Rocks, Woods' Point, Broughton Creek.  
 Clay band, iron ore, brown hæmatite. From Upper Coal Measures, Wallerawang Iron and Coal Company. Analysis, 49·28 to 56 per cent. metallic iron.  
 Magnetic iron. Near Barraba.  
 Chrome iron. Near Barraba.  
 Brown hæmatite. Coal Range, Clarence River.  
 Concretionary ironstone. Newstead, New England.  
 Stalactitic iron ore (limonite). Lithgow Valley. From Mr. T. Brown, M.L.A.  
 Stalactitic iron ore (limonite). Lithgow Valley. From Mr. T. Brown, M.L.A.  
 Titaniferous iron. Rocky River. From Mr. Cleghorn.  
 Micaceous and magnetic iron ore. Blackford's Lease, near Mount Lambie.  
 Magnetic oxide of iron. Devonian beds, Wallerawang Iron and Coal Company. Analysis, 40·89 per cent. metallic iron.  
 Brown hæmatite. Devonian Beds, Wallerawang Iron and Coal Company. Analysis, 37·84 to 51·2 per cent. metallic iron.  
 Magnetic oxide of iron. From Devonian Beds, Mount Lambie, Lithgow Valley, Iron Company.  
 Brown hæmatite. From Devonian Beds, Wallerawang Iron and Coal Company. Analysis, 37·84 to 51·2 per cent. metallic iron.  
 Iron ore garnet rock. From Devonian Beds, Wallerawang Iron and Coal Company. Analysis, 21·05 per cent. metallic iron.  
 Magnetite. Solferino.  
 Brown hæmatite. Devonian Beds, Wallerawang Iron and Coal Company. Analysis, 38·84 to 51·2 per cent. metallic iron.  
 The above-mentioned analyses were made by Professor Liversidge, University of Sydney.

#### AURIFEROUS QUARTZ, WASH DIRT, GALENA, AND ANTIMONY.

Auriferous quartz. Dayspring Gold Mining Company's reef, 2 ft. 6 in. thick. Average yield of 5,674 tons of this quartz gave 11 dwts. 12 grs. of gold per ton. Lachlan District.  
 Auriferous quartz. Strickland's Reef, near Forbes. Assay, 4 oz. 6 dwts. 6 grs. gold per ton.  
 Auriferous wash dirt. Uralla.  
 Tertiary auriferous cement with silicate of iron. Two-mile Flat, Cudgegong River. From Rev. W. B. Clarke, M.A., F.G.S.  
 Auriferous ferruginous quartz drift, with coarse gold visible. From "Wapping Butcher" Lead, near Forbes.  
 Auriferous wash dirt. Home Rule Lead, Home Rule.  
 Auriferous wash dirt. No. 24, Black Lead,—John M'Lachlan and Party; depth 160 feet.  
 Auriferous ferruginous quartz drift with bed-rock. Jones and Party.  
 Auriferous wash dirt. Prospecting Claim, Canadian Lead, near Forbes. Do. Nil Desperandum Lead.  
 Auriferous quartz. Quong Tait's claim, Lady Belmore Line of Reef, Braidwood. Yield, 19 oz. gold per ton.  
 Auriferous quartz. Court's 4-acre Lease, Hawkins' Hill View. From Mr. James Daw.  
 Black sand with gold, zircons, tin ore, magnetic iron, &c. Tumberumba.  
 Auriferous quartz. Old Hill Reef, Adelong.  
 Do. Strickland's Reef, Forbes District.  
 Do. with iron pyrites. Average yield, 8 ozs. gold per ton, depth 90 feet. Quong Tait's claim. Lady Belmore line of reef, Braidwood.  
 Do. Bingera.  
 Do. with galena. Sebastopol Reef, near Junee.

Auriferous quartz with arsenical pyrites and galena. Strickland's Reef, near Forbes. Assay per ton:—gold, 1 oz. 10 dwt. 1 gr.; silver, 1 oz. 19 dwt. 4 grains.

Broken auriferous quartz. County of Clive, from Rev. W. B. Clarke, M.A., F.G.S.

Auriferous quartz. Depth, 45 feet. Harper and Party's, No. 1, South Suck's-all Reef, Oberon.

Petrified wood. 20 feet from surface, 5 miles from Trunkey.

Auriferous quartz. Depth, 420 feet. Yield 4 oz. per ton gold. North Williams Claim, Adelong.

Auriferous quartz (burnt). Yield, 12 oz. gold per ton. Depth, 60 feet. Quong Tait's Claim, Lady Belmore Line of Reef, Braidwood.

Auriferous quartz. Depth, 30 feet. From Lewis E. Johnson's lease, Crudine Creek.

Sulphide of antimony. Solferino.

Galena in quartz. Major's Creek, near Braidwood.

Carbonate and sulphide of lead and sulphide of copper. Solferino.

Sulphide of antimony. Nundle gold field.

Do. Near Gundagai.

Do. Near Wallerawang.

Arsenic. Lunatic Reef.

Wolfram. New England.

Auriferous quartz. Depth, 300 feet. Adelong. Presented by Mr. Seymour C. Stewart, J.P.

Galena. Eurongilly, Murrumbidgee District.

Auriferous quartz. Junee Reef.

Do. Depth, 40 feet. Fagan Beatach's Reef, Oberon.

Do. Hansen and Party's Reef, near Oberon.

Do. Depth, 70 feet. Lambert and Davies' Claim, Oberon.

Auriferous brown oxide of iron. Alfred Town Reefs, near Wagga Wagga.

Auriferous quartz. Hill End, from Mr. Hagarty.

#### COPPER ORES.

Sulphide of copper. Goodrich Copper Mining Company, county of Gordon. From Mr. H. A. Thomson.

Green and blue carbonate of copper. South Wiseman's Creek, near Bathurst. From Capt. Armstrong, R.N.

Sulphide of copper. Ophir Copper Mine, county of Bathurst. Assay, 27·49 per cent. copper.

Do. Banden and Fisher's Copper Mine, Clarence District. Assay, 24·19 per cent. copper.

Do. Cow Flat, near Bathurst.

Green carbonate of copper (ferruginous). Goodrich Copper Mine.

Sulphide of copper, with galena. Wiseman's Creek, near Bathurst.

Sulphide of copper. Wiseman's Creek, near Bathurst.

Carbonate of copper. Armstrong Copper Mine, Wiseman's Creek.

Copper ingot. Carangara Copper Mine, county of Bathurst.

Sulphide and black oxide of copper. Armstrong Copper Mine, near Bathurst.

Sulphide of copper. Hurley and Wearne's Copper Mine, Wellington District.

Carbonate of copper. Armstrong Copper Mine. 85 per cent. copper; 4 dwts. gold, 6 ozs. silver, per ton.

Red oxide of copper. Belara Copper Mine, 20 miles from Gulgong. Assay, 30 per cent. copper.

Sulphide of copper. Cow Flat, near Bathurst.

Sulphide of copper. Ophir Copper Mine, county of Bathurst.

Carbonate of copper. Goodrich Copper Mine, county of Gordon.

Red oxide of copper. Bobby Whitlow Copper Mine, near Bingera.

Sulphide of copper. Ophir Copper Mine, county of Bathurst.

Sulphide of copper. Cow Flat, near Bathurst.

#### IRON ORES.

Brown hæmatite. Berrima.

Do. Clay-band iron ore. From coal measures. Wallerawang Iron and Coal Company. Analysis, 49·28 to 56 per cent. metallic iron.

- Brown hæmatite. Clay-band iron ore. From coal measures. Lithgow Valley, analysis, 46·42 per cent. metallic iron.  
 Magnetic oxide of iron. Mount Lambie.  
 Brown hæmatite. Veins in Hawkesbury Rocks, Lithgow Valley. From the Hon. John Lucas, Minister for Mines.  
 Do. Berrima.  
 Magnetic oxide of iron. Wallerawang. Devonian beds. Analysis, 40·89 per cent. metallic iron.  
 Brown hæmatite. Clay-band iron ores. From coal measures. Lithgow Valley Iron Company. Analysis, 46·42 per cent. metallic iron.

#### AURIFEROUS QUARTZ, GALENA, AND ANTIMONY.

- Galena. Sulphuret of lead. Mylora, near Yass. From Mr. R. Dudley Adams.  
 Gold, silver, lead, iron, antimony, and cobalt in quartz. From reef 2 feet thick, Major's Creek, near Braidwood.  
 Auriferous quartz. From depth of 125 feet, Snob's Claim, Big Hill, Major's Creek, near Braidwood.  
 Argentiferous quartz. Clarence District. Assay:—silver, 30½ ozs.; gold, 17 dwts. per ton.  
 Do. Lombardy Reef, Solferino.  
 Do. with large cubical iron pyrites. United Miners, Snob's Reef, Major's Creek, near Braidwood.  
 Sulphuret of antimony. Pyramul. Analysis, 67 per cent. antimony. From the Hon. John Lucas, Minister for Mines.  
 Auriferous quartz. United Miners, Snob's Reef, Braidwood.  
 Do. Strickland's Reef, 8 miles north of Forbes.  
 Do. Prospector's Claim, Manton's Reef, Solferino.  
 Do. Strickland's Reef, 8 miles north of Forbes.  
 Do. with pyrites. Snob's Reef, Major's Creek, near Braidwood.

#### TIN AND TIN ORE.

- Ingot of tin. Vegetable Creek Tin Mining Company, New England.  
 Do. St. Leonard's Smelting Company. Assay, 99·9 per cent. tin. From Mr. H. A. Thompson.  
 Do. Australian Tin Smelting Company, Sydney.  
 Tin in bars. Do. do.  
 Cassiterite. Large piece of wood tin from Deepsinkers' Mine, the Gulf, New England. From Mr. J. Hawkins Butchart.  
 Lode tin in euritic granite. Bolitho Tin Mine, Cope's Creek, New England.

- 1a.—Collection of the chief characteristic Fossils, illustrative of the Principal Sedimentary Formations of New South Wales. Exhibited by Department of Mines, Sydney.

#### PALÆOZOIC. *Upper Silurian.*

- Orthoceras. Terago, county of Argyle.  
 Receptaculites Clarkei, or Australis. Wellington District.  
 Crinoid. Two miles north-west of Molong.  
 Favosites polymorpha. Goodradigbee River, between Dutton's Grant and Village Reserve.  
 Orthoceras. Gambola Paddock, near Molong.  
 Tentaculites. Holmes' Station Paddock, 6 miles from Wellington.  
 Cyathophyllum. Limestone Rocks, south of and adjoining Wellington Caves.  
 Murchisonia? Quedong.  
 Coral. Holmes' Station Paddock, 6 miles from Wellington.  
 Streptorhynchus. Molong.  
 Trochus. Goodradigbee River, between Dutton's Grant and Village Reserve.  
 Stenopora. 1½ mile north-west of Molong.  
 Favosites.  
 Halysites catenipora. Molong, R. C. Church.  
 Streptorhynchus. Molong.  
 Stem of Crinoid.  
 Leptæna and Spirifer. Holmes' Station Paddock, 6 miles from Wellington.  
 Pentamerus. Quedong.

PALÆOZOIC. *Devonian.*

Lepidodendron nothum. Range, 10 miles north of Goulburn.  
 Spirifer, rhynchonella, &c. Mt. Lambie, near Rydal.  
 Favosites Gothlandica. Mt. Lambie.  
 Modiola, rhynchonella, &c. Mt. Lambie.  
 Spirifer, rhynchonella, &c. The Gulf, Turon River. From the Rev. W. B. Clarke, M.A., F.G.S.  
 Favosites Gothlandica. Wallerawang.  
 Encrinite stems. Mt. Lambie.  
 Spirifers. Wolgan Valley.  
 Modiola, rhynchonella, &c. Mt. Lambie.  
 Encrinite stems. Mt. Lambie.  
 Pecten, spirifer, and rhynchonella. Mt. Lambie.  
 Lepidodendron nothum. Mt. Lambie.

PALÆOZOIC—*Carboniferous, Lower Coal Measures.*

Otopteris ovata. Stroud, Port Stephens.  
 Knorria. Do. do.  
 Otopteris ovata. Do. do.  
 Do. and calamites. Stroud, Port Stephens.  
 Do. and sphenopteris. do. do.  
 Knorria. Stroud, Port Stephens.  
 Otopteris ovata. do. do.  
 Sphenopteris? do. do.  
 Knorria. do. do.  
 Calamites. do. do.  
 Fossil plant stem. do. do.  
 Undetermined. do. do.  
 Lepidodendron. do. do.  
 Euomphalus, strophomena, productus, orthids, corals, &c. Stroud, Port Stephens.  
 Spirifer, productus, &c. Stroud, Port Stephens.  
 Do. euomphalus, &c. do. do.  
 Do. strophomena, &c. do. do.  
 Strophomena. do. do.  
 Spirifer, strophomena, rhynchonella, &c. Stroud, Port Stephens.  
 Productus cora. Stroud, Port Stephens.  
 Spirifer. do. do.  
 Euomphalus, corals, &c. do. do.  
 Productus. do. do.  
 Lepidodendron. Northern District.  
 Do. Brush Hill Creek, county of Brisbane.  
 Fenestella. Northern District.  
 Do. Quarrybylong, county of Northumberland.  
 Lepidodendron. Alex. Cameron's, Davis Creek, parish of Doon, county of Durham.  
 Retepora. Parish of Doon, county of Durham.  
 Strophomena, spirifer, &c. Northern District.  
 Spirifer, fenestella, productus, &c. Quarrybylong, county of Northumberland.  
 Cyathophyllum. Cameron's 198 acres, Rouchell Brook, parish of Doon, county of Durham.  
 Encrinite stems. Parish of St. Aubin, county of Durham.  
 Encrinite stems.  
 Chætetes radians. Singleton.  
 Chætetes radians. Singleton.  
 Pachydomus? Singleton.  
 Calcareous concretion. Singleton.  
 Chætetes radians. Dry Creek, near Barraba, county of Northumberland.  
 Bellerophon. Singleton.  
 Spirifer. Singleton.  
 Notomya? Singleton.  
 Conularia torta. Ravensfield.  
 Do. tenuistriata. Do.  
 Bellerophon, spirifer, pachydomus? &c. Ravensfield.  
 Pachydomus. Ravensfield.  
 Orthoceratite. Ravensfield.  
 Spirifer. Ravensfield.  
 Orthoceratite. Ravensfield.

*Spirifer* and *productus*. Ravensfield.  
*Pachydomus* and *pleurotomaria*. Harper's Hill.  
*Bellerophon*. Ravensfield.  
*Pachydomus gigas* and *favosites*. Harper's Hill.  
*Spirifer*.  
*Pachydomus gigas*. Harper's Hill.  
*Pleurotomaria*. Harper's Hill.  
*Pecten* and *Bellerophon*. Ravensfield.  
*Pachydomus?* Harper's Hill.  
*Spirifer*. Harper's Hill.  
     *Do.* Wollombi.  
*Euomphalus*, &c. Wollombi.  
*Fenestella*. Wollombi.  
*Spirifer*, *productus*, &c. Campbell's Hill.  
*Inoceramus Mitchellii*. Greta.  
*Pleurotomaria*. Greta.  
*Productus*. Campbell's Hill.  
*Conularia torta*. Greta.  
*Fenestella*. Campbell's Hill.  
*Euomphalus*. Greta.  
*Crinoid stem*. Greta.  
*Spirifer*. Greta.  
*Pecten*. Wollongong.  
*Bellerophon*. Wollongong.  
*Spirifer*. Jamberoo.  
     *Do.* Wollongong.  
*Pleurotomaria*. Jamberoo.  
*Spirifer vesperilio*. Wollongong.  
*Productus*, *fenestella*, *crinoid stem*. Cajolla Creek, Ulladulla.  
*Pachydomus*. Jamberoo.  
*Spirifer*. Marangaroo.  
*Productus*, *spirifer*, &c. Marangaroo.  
*Productus*. Marangaroo.  
*Spirifer vesperilio*. Marangaroo.  
     *Do.* *productus*, &c. Marangaroo.

*PALEOZOIC—Upper Coal Measures.*

*Glossopteris Browniana*, &c. Berrima.  
*Vertebraria Australis*. Jamberoo.  
*Glossopteris Browniana* (various forms). Blackman's Flat, near Wallerawang.  
*Glossopteris*, &c. Wallerawang.  
*Vertebraria Australis*. Near Wallerawang.  
     *Do.* do. Coerwull, near Bowenfels.  
*Peltate Leaf* and *Vertebraria Australis*. Near Wallerawang.  
*Peltate Leaf* and *Vertebraria Australis*. Near Wallerawang.  
*Strobilites?* Coerwull, near Bowenfels.  
*Phyllothea Hookerii* and *Glossopteris Browniana*. Newcastle.  
*Sphenopteris*. Newcastle.  
*Phyllothea*. Newcastle.  
*Glossopteris Browniana*. The Nobby's, Newcastle.  
*Sphenopteris*, *glossopteris*, and *phyllothea*. Newcastle.  
*Sphenopteris*, *glossopteris*, and *phyllothea*. Newcastle.  
*Glossopteris* and *phyllothea Hookerii*. Newcastle.  
     *Do.* Newcastle.  
*Unknown*. Newcastle.  
*Conifer stem* and *phyllothea*. Waratah Coal Mine, Newcastle.  
*Glossopteris* and *phyllothea*. Newcastle.  
*Phyllothea*. Newcastle. From Australian Agricultural Coal Seam.

*PALEOZOIC.—Hawkesbury Series.*

Columnar sandstone. Botany Heads.  
 Plant impressions. Woolloomooloo.  
*Phyllothea*. Woolloomooloo.  
 Photograph of *cleithrolepis granulatus*, found in railway cutting. Blackheath  
 Blue Mountains, Great Western Railway. From Mr. T. Brown, M.L.A.

PALÆOZOIC.—*Wianamatta Series.*

Photograph of palæoniscus, found by P. F. Adams, Esq., Surveyor General in the Gib Tunnel, Great Southern Railway.  
 Palæoniscus. Gib Tunnel, Great Southern Railway. Found by P. F. Adams, Esq., Surveyor General.

## MESOZOIC?

Pecopteris? Clarence River.

CAINOZOIC.—*Lower Miocene. (Plant beds.)*

Miocene tertiary plants. County of King.  
 Do. do. Clarence District.

CAINOZOIC.—*Pliocene.*

Pliocene tertiary plants. Gulgong.

CAINOZOIC.—*Pleistocene and Recent.*

Bone 16 feet below surface. Castlereagh River, from Mr. T. Brown, M.L.A.  
 Molar teeth of wombat. Wellington Caves.  
 Portion of canine teeth (canis dingo). Wellington Caves.  
 Molar teeth (macropus). Wellington Caves.  
 Bone of wombat (phascolomys). Wellington Caves.  
 Dorsal vertebra of wallaby (halmaturus). Wellington Caves.  
 Molar tooth of wallaby (halmaturus). Wellington Caves.  
 Upper and lower canine teeth of Tasmanian devil (sarcophilus ursinus). Wellington Caves.  
 Left ramus lower jaw (bettongia). Wellington Caves.  
 Molar tooth of Tasmanian devil (sarcophilus ursinus). Wellington Caves.  
 Three molar teeth of kangaroo rat (bettongia). Wellington Caves.  
 Bones of opossum (phalangista vulpina). Bone Cave, near Mount Lambie.  
 Bones of native cat (dasyurus). Bone Cave, near Mount Lambie.  
 Bones of kangaroo (macropus). M'Intyre's Cave, near Mount Lambie.  
 Mogo, or stone tomahawk, found 14 feet below surface at Bodalla from Mr. T. S. Mort.  
 Mogo or stone tomahawk. Bodalla, from Mr. T. S. Mort.  
 Mogo or stone tomahawk. Western District, from Mr. T. Brown, M.L.A.  
 Sandstone bored by shell-fish. Newcastle Harbour.  
 Atlas vertebra of diprotodon Australis (Owen) Bennettii (Kreff). New South Wales.  
 Portion of right lower jaw of diprotodon Australis. New South Wales.  
 Upper incisors of a large diprotodon, probably from Queensland.  
 Lower jaw of thylacoleo (restored from a right and left of two animals), from Wellington Caves.  
 Portions of lower jaws of thylacoleo from Wellington Caves.  
 Portion of right lower jaw of gigantic wombat. New South Wales.  
 Portion of ulna, a gigantic wombat. New South Wales.  
 Humerus of wombat. New South Wales.  
 Auriferous quartz tailings. Forty-five samples from the gold-fields of New South Wales.  
 Stanniferous-wash tailings. Seven samples from tin fields of New South Wales.  
 Kerosene shale, from the mine of Mr. J. de V. Lamb and Mr. J. Brown, Joadja Creek, Berrima.  
 Kerosene shale. American Creek, Wollongong (showing impressions of glossopteris).  
 Fireclay. Lithgow Valley Iron Company Eskbank.  
 Exhibited by New South Wales Commissioners:  
 Lode tin (411 specimens) from a lode in eutritic granite at Bolitho Tin Mine, Cope's Creek, New England, New South Wales.  
 Collection of minerals (184 specimens) exhibited by Arthur Dewhurst, Government District Surveyor, Tamworth, New South Wales.  
 Collection of minerals (33 specimens) from the New England District, New South Wales. Exhibited by Cleghorn, William, Mount John, Uralla.  
 Collection of minerals (18 specimens) from the Richmond River, exhibited by W. Wilson, Monaltrie, Richmond River.  
 Collection of Minerals, exhibited by McCullum, Argyle, Good Hope, near Yass.  
 Samples of auriferous chlorite schist, containing magnetite and specular iron ore, from Mount Lambie. Coulter, Mr.

Samples of iron ore from Gosford, Brisbane Water. Exhibited by Fountain, John.  
 Auriferous quartz. Exhibited by Steuart, Seymour, C., Adelong.  
 Fossils and minerals. Exhibited by King, Philip G., Goonoo Goonoo.  
 Collection of tin ores, from New England, New South Wales. Butchart, J. H.  
 Mort's Rooms, Pitt Street, Sydney.  
 Iron ore from Lithgow. The Lithgow Valley Iron and Coal Company.  
 Auriferous quartz and wash-dirt. Curtis, T. J., engineer and manager.

## CLASS 101.

Department of Mines, Sydney.  
 Section of coal seam worked in the Northern Coal Field.  
     Do.                      Western Coal Field.  
     Do.                      Southern Coal Field.  
     Do.                      Hunter River Coal Field.  
 Blocks of coal from the Northern Coal Field.  
     Do.                      Western Coal Field.  
     Do.                      Southern Coal Field.  
     Do.                      Hunter River Coal Field.  
 "Kerosene shale," petroleum oil coal, from the New South Wales Shale and Oil Company's Mine, Hartley Vale.  
 "Kerosene shale," petroleum oil coal, from the mine of Mr. J. De V. Lamb and Mr. J. Brown, Joadja Creek, Berrima.  
 "Kerosene shale." From America Creek, near Wollongong (showing impressions of *glossopteris*).  
 Coke. From J. Fletcher, manager of the Co-operative Mine, Newcastle District.  
 Kerosene shale. The New South Wales Shale and Oil Co., 3, Hunter Street, Sydney.  
 Kerosene shale from Murrurundi. Towns, R., & Co., Sydney.  
 Coal, from Lithgow. The Lithgow Valley Iron and Coal Company.

## CLASS 102.

Department of Mines, Sydney. Samples of marble (polished and rough).  
 Marble. Five samples from Wallerawang Limestone Reserve, near Wallerawang.  
 Marble. Cow Flat, three samples.  
 Marble. Marulan, three samples.  
 Marble. Terrabandra, near Tumut.  
 Sandstone, block of fine-grained, from West Maitland. Browne, Thomas, Bishop's Bridge.  
 Sandstone, block of, from Pymont Quarry. Specimen of the ordinary building stone used in Sydney. Macready Bros.  
 Sandstone. Two blocks. Young, John, contractor, Sydney.  
 Slate (surface specimen), from a slate quarry near Goulburn. Douglass, W., 434, George-street, Sydney.  
 Granite. One block, from Moruya. Young, John, Contractor, Sydney.  
 Marble. Two blocks, veined and light-coloured, from Cow Flat. Young, John, Contractor, Sydney.  
 Marble, black. From Bungonia. Young, John, Contractor, Sydney.  
 Marble, dark mottled. From Marulan. Do.  
 Marble, dove-colour. From Marulan. Do.

## CLASS 104.

Department of Mines, Sydney. Specimen of Fireclay from Upper Coal Measures, Lithgow Valley Iron Company's Mine, Eskbank.  
 Kaolin. Macintosh and Oakes, Bathurst.  
 Kaolin. Warden, David, Ulladulla.

## CLASS 107.

Brown, Thomas, Member of the Legislative Assembly, New South Wales.  
 Samples of alum and magnesian salts, from Caverns in Coal Measures Rocks, Cullen Bullen, Turon District.

## CLASS 110.

Gold trophy, bearing the following inscription:—"This model represents the quantity of gold obtained in New South Wales, from 1851 to 1874. Weight, 8,205,232.598 ounces. Value, 30,536,246*l.* 10*s.* 6*d.*"

## DEPARTMENT OF MINES, SYDNEY.

Samples of gold characteristic of the Gold Fields of New South Wales, and assayed at the Royal Mint, Sydney.

Locality.	Description of Gold.	Weight of Sample.	Loss in melting per cent.	Gold and Silver in 1,000 parts after melting.		Value per oz. after melting, at $\$7.17s.10\frac{1}{2}d.$ Standard.
WESTERN DISTRICT.		Ozs.		Gold.	Silver.	£ s. d.
Sofala -	In fine scales, and coarse plates and grains.	2'50	1'54	923'0	72	3 18 9½
Bathurst -	Fine scales and coarse grains, with some spongy and stringy.	2'00	2'00	923'5	71	3 18 10
" -	Fine scales, plates, and coarse grains.	2'00	1'47	918'0	76	3 18 4½
Hargraves -	Fine dust and coarse grains -	2'00	2'23	920'5	70	3 18 6½
" -	Scaly with some grains -	2'00	1'15	961'0	33	4 1 9½
Tambaroora -	Fine and coarse scaly and grains	2'00	1'31	940'0	54	4 0 1
" -	Fine scales and grains -	2'00	1'55	943'5	50	4 0 5
" -	Reef gold; reticulated -	2'00	2'77	944'5	51	4 0 6
" -	Coarse waterworn grains or nuggets.	2'53	2'00	935'5	54	3 19 8½
Hill End -	Fine dust and coarse grains -	2'00	2'47	945'5	47	4 0 7
" -	Scaly, with coarse spongy grains	2'00	1'41	945'5	50	4 0 7
" -	Fine scales and coarse crystalline gold.	2'00	2'18	947'0	47	4 0 8½
" -	Scaly and coarse filiform gold -	2'00	1'97	942'5	49	4 0 4
Mudgee -	Fine scales and coarse grains -	2'50	1'93	941'0	56	4 0 2½
" -	Coarse grains with some scales -	2'00	2'04	928'0	68	3 19 0
" -	Fine and coarse scales -	2'00	1'77	937'0	58	3 19 10½
Gulgong -	Coarse spongy grains and some scales.	2'00	1'78	938'0	58	3 19 11½
" -	Dust and coarse scales -	2'00	1'78	916'5	79	3 18 3
" -	Coarse pieces—filiform and spongy.	2'00	1'78	925'0	70	3 18 11
" -	Scaly, with some grains -	2'00	1'59	946'0	48	4 0 7½
Carcoar -	Fine scales, very porous, with some magnetic iron.	2'00	10'92	878'0	119	3 15 2
" -	Fine and coarse filiform gold of a dark colour.	2'00	2'94	960'0	36	4 1 8½
Orange -	Scaly -	2'00	2'67	943'0	51	4 0 4½
" -	Fine dust—"gunpowder gold" -	2'00	2'53	930'5	62	3 19 4
Stony Creek -	Scaly -	2'00	1'56	942'0	54	4 0 3½
SOUTHERN DISTRICT.						
Braidwood -	Plates and fine scaly -	2'00	1'79	959'0	34	4 1 7½
Araluen -	Fine dust, "gunpowder gold" -	2'00	2'19	951'5	42	4 1 0½
Adelong -	Fine scaly and coarse filiform -	2'00	2'63	944'0	52	4 0 5½
" -	Scaly -	2'00	1'27	941'0	53	4 0 2
" -	Coarse filiform with some scaly	2'50	1'69	946'0	50	4 0 7½
Tumut -	Fine and coarse, some very spongy.	2'00	6'28	927'5	70	3 19 1½
Young -	Scaly dust gold -	2'00	2'39	957'0	36	4 1 5½
" -	Fine dust, "gunpowder gold" -	2'00	1'52	943'0	49	4 0 4½
Nerrigundah -	Strings, scales, and plates -	2'50	1'64	980'5	15	4 3 4½
Kiandra -	Scales and plates with some grains and threads.	3'00	3'15	927'0	63	3 19 1
Goulburn -	Coarse grains and reticulated -	2'00	6'87	975'0	22	4 2 11½
Bombala -	Very fine scaly dust, "gunpowder gold."	2'00	2'63	963'0	34	4 1 11½
Cooma -	Filiform crystalline and some scaly.	2'00	3'17	933'0	56	3 19 11½
" -	Filiform crystalline and some scaly.	2'00	4'22	924'0	70	3 18 10
NORTHERN DISTRICT.						
Nundle -	Fine scaly and coarse filiform -	2'00	3'33	919'5	73	3 18 6
" -	Scales, plates, and coarse filiform; of a brownish colour.	2'00	3'28	902'5	90	3 17 1½
Tamworth -	Spong, filiform, and crystalline, some with a little quartz attached.	2'00	3'28	912'0	83	3 17 10½
" -	" -	2'00	3'31	914'0	80	3 18 0½
" -	Fine dust and shotty grains -	2'00	3'31	899'5	93	3 16 10½
Armidale -	Scales with some threads -	2'00	3'30	948'0	44	4 0 9
" -	Fine scales -	2'00	1'91	883'5	103	3 16 0

Department of Mines, Sydney.

J 360. Pig iron. From the Lithgow Valley Iron Company's Works, Esk Bank.

CLASS 112.

Copper. 71 ingots. N.S.W. Commissioners.

CLASS 113.

- ☛ Tin refined in ingots. One ton. Moore & Co., Sydney.  
 Tin. One ingot. Vegetable Creek Co.  
 ☛ { Tin. Twenty ingots. }  
 { 123 bars. } Commissioners for New South Wales.  
 { Two bags grain tin. }

CLASS 121.

- Model of shaft of Vegetable Creek Tin Mine.  
 Tin ore. Twelve specimens from do.  
 Specimens of washdirt taken from depth of 53 feet.  
 Report, plan, and photographs. Cadell, Alfred, C.E.  
 Comet kerosene oil, &c. The Shale and Oil Company, Sydney.  
 ☛ Stearine candles. Manufactured by Robertson & Co., Sydney.  
 Soap, common yellow. Manufactured by Layton, Fred., Grafton, Clarence River.  
 Candles, mould. Manufactured by Layton, Fred., Grafton, Clarence River.  
 Stoneware, &c. Manufactured by Baldock & Co.  
 Stained glass staircase window, subject "Captain Cook." Lyon, Cottier, & Co., Pitt Street, Sydney.

CLASS 227.

- ☛ Window sashes, cedar, outside hall door, inside four-panel door, drapery panel door, French casements, set of cedar table legs, Hudson Brothers, Steam Joinery Mills, Sydney.

CLASS 229.

- ☛ Mats and matting, made of cocoa-fibre yarn, manufactured by aborigines of New South Wales and Frazer's Island, they having learned the trade in Darlinghurst Gaol. Read, John Cecil, Darlinghurst, Sydney.

CLASS 235.

- ☛ { 27 pieces colonial tweeds - }  
 { 19 do. do. - } Manufactured by J. Vicars, Sydney.  
 { 6 plaids - - - - }  
 { 11 Shawls - - - - }

CLASS 254.

- Wool flowers, copied from Australian native flowers, exhibited by Mrs. Midgley.  
 2 stuffed platypus (*Ornithorhynchus paradoxus*), male and female.  
 1 travelling rug of tanned Platypus skins.  
 ☛ 1 set of collaret and cuffs of do.  
 Exhibited by P. A. Jennings, Karoola, St. Mark's, Sydney.  
 Furs and skins of opossum, platypus, wallaby, and kangaroo, all procured in the Clarence District. Tanned and exhibited by Layton, Fred., Grafton.  
 Wallaby skin rug. New South Wales Commissioners.  
 ☛ Books, bookbinding, and printing from the Government Printing Office, Sydney.  
 Richards, Thos.  
 Lindt's Portfolio of Australian aborigines. New South Wales Commissioners.  
 Greville's Post Office Directory. New South Wales Commissioners.  
 Australian orchids—1st Part. Fitzgerald, R. D.  
 Mines and mineral statistics. The Honourable the Minister for Mines.  
 Christian psychology—2 vols. Sutherland, Rev. G.  
 Mineral map and general statistics of New South Wales. New South Wales Commissioners.  
 Aboriginal implements. Exhibited by Wilcox, J. F., Clarence River.  
 Ditto. Exhibited by Brown, Thos., M.L.A., Eskbank, Bowenfels.  
 Twenty aboriginals' implements. Stone hatchets in various stages of manufacture and wear, composed of indurated sandstone, conglomerate, slate, trachyte and basalt. W. Wilson, Richmond River.  
 ☛ Industrial work. Asylum for the Blind.  
 ☛ Meteorological results. Thomas Richards, Sydney.

## CLASS 277.

- ☛ Mechanical dentistry. Exhibited by Spencer, John, 8, Wynyard Square, Sydney.

## CLASS 286.

Brushware. Manufactured by Taylor, S., Sydney.

6 coils, assorted, best Manila rope; 4 coils, assorted, New Zealand flax rope; 4 doz. lines New Zealand flax rope. Manufactured by A. Forsyth & Co., Sydney.

## CLASS 289.

Basket ware. R. Green, 50, Park Street, Sydney.

## CLASS 293.

Concord buggy with canoe front; woodwork and ironwork entirely of New South Wales material. The body is made of colonial beech (*Vitex*), the naves and felloes of spotted gum, the spokes of box, and the under carriage and shafts of spotted gum. The tires of the wheels, axles, and springs were also manufactured by exhibitor. Robertson, John, coach builder, Pitt Street, Sydney.

Stockman's Saddles, No. 1.

Lady's side-saddle. Manufactured by John Elder, 294, Castlereagh Street.

1 set single horse buggy harness.

1 set double buggy harness for pair of horses.

1 gentleman's hogskin saddle.

1 gentleman's hunting saddle. Manufactured by W. H. Simpson, 385, George Street, Sydney.

Gentleman's saddle.

- ☛ Stockman's saddles, No. 2. P. Guerin, 472, Elizabeth Street.

Corporate seal and catalogue of the Sydney Mechanics' School of Arts.

## CLASS 312.

25 specimens of natural history of Australia. Exhibited by the Trustees of the Australian Museum, Sydney.

100 specimens of the birds of Australia. Exhibited by the Trustees of the Australian Museum.

137 specimens of the birds of Australia. Exhibited by the N.S.W. Commissioners.

A sematrophe. An instrument designed by exhibitor for army signalling purposes. Parrott, T. S., Surveyor General's Office, Sydney.

## CLASS 335.

- ☛ Maps of the Colony of New South Wales. The Honourable the Minister for Lands.

Views of Port Jackson. } New South Wales Commissioners.  
Views of Newcastle. }

Map of Northern Circumpolar Stars. Butterfield, G., Homebush.

Lithograph (mounted on rollers) of Pioneer Narrow Railway—1 ft. 6 in. gauge. Exhibited by Trengrouse, N., Stanmore Road, Newtown.

## CLASSES 411 to 432.

2 water-color drawings of Public Works Office and General Post Office, Sydney. Exhibited by Barnet, J., Colonial Architect.

Panorama of Sydney, harbour, and suburbs—36 ft. x 5 ft.

- ☛ View of Sydney Heads, Port Jackson—7 ft. x 2 ft. Exhibited by B. O. Holtermann.

2 views, interior of Sydney Exhibition.

1 view, exterior of Sydney Exhibition.

Exhibited by N.S.W. Commissioners.

- ☛ { 20 views, Clarence River scenery } Photographed by W. T. Lindt.  
12 portraits of aborigines, &c. }

Exhibited by N.S.W. Commissioners.

- ☛ 2 views of Public Offices, Sydney; and 4 views of Post Office. Exhibited by Barnet, J., Colonial Architect.

- ☛ Photographic portraits (4 cases). Newman, J. Hubert, photographer, 12, Oxford Street, Sydney.

108 photographs of buildings, &c., in and around Sydney, New South Wales. Exhibited by T. Richards, Government Printer.

22 photographs of Blue Mountain scenery and Valley of the Grose. New South Wales Commissioners.

Photo-mechanical Printing. John Degotardi, Sydney.

Seven photo-lithographs. (By John Sharkey.)

#### CLASS 568.

Ice-maker and water-cooler. Postle, J. D.

#### CLASSES 600 to 605.

#### WOODS OF NEW SOUTH WALES.

**OBSERVE.**—The first name, in small capitals, is the botanical name. The second name, in italics, is the natural order. Then follows the description of the tree, — and after that, the aboriginal name in small capitals,—the local name in italics,—the diameter in inches,—the height in feet and inches.

**EUCALYPTUS SP. *Myrtaceæ*.** From Illawarra, the most valuable perhaps of all the iron-barks, remarkable for its smooth uniform outer bark and its very hard tough inlocked strong wood. *BARREMA. White or pale Iron-bark.* D. 36—48. H. 80—120.

**EUCALYPTUS SP. *Myrtaceæ*.** Variety from Brisbane Water, reported to be more tough and durable, and more pleasant to work, than the common iron-bark. *White Iron-bark.*

**EUCALYPTUS SP. *Myrtaceæ*.** From Illawarra; differs apparently from the iron-bark of Cumberland and Camden; a strong and most durable timber. *Iron-bark.* D. 36—60. H. 80—130.

**EUCALYPTUS SP. *Myrtaceæ*.** From Appin; common in Cumberland, one of the strongest and most durable of timbers. *TERRI-BARRI. Broad-leaved Rough Iron-bark.* D. 24—48. H. 80—120.

**EUCALYPTUS SP. *Myrtaceæ*.** From Camden; of smaller and more tortuous growth than either of the first four varieties; its timber redder, closer, softer, more easily worked, and probably not so durable. A most highly-valued timber-tree. *MOKAARAGO. Narrow-leaved smooth or red Iron-bark.* D. 24—43. H. 50—90.

**EUCALYPTUS SP. *Myrtaceæ*.** From Appin; harder and much coarser in the grain than the last. *Narrow-leaved Iron-bark.* D. 24—48. H. 60—100.

**EUCALYPTUS SP. *Myrtaceæ*.** A tree with magnificent timber, of first-rate quality for size, hardness, toughness, and durability. *GNOOROWARRA. Box of Illawarra.* D. 48—72. H. 120—180.

**EUCALYPTUS SP. *Myrtaceæ*.** An excellent timber. The tree of most unsightly appearance, and almost invariably hollow, or decayed at heart, before attaining full stature. The wood greatly prized for plough beams, poles, and shafts of drays and carts, spokes of wheels, &c. *BARROUL GOURRAH. Bastard Box.* D. 24—48. H. 60—100.

**EUCALYPTUS SP. *Myrtaceæ*.** A famous timber for ship-building and for house carpentry. *THURAMBAL. Flooded Gum.*

**EUCALYPTUS SP. *Myrtaceæ*.** A good gum timber, a link apparently between that great division and the one called box. *DTHACKAI COURROO.* D. 36—48. H. 80—120.

**EUCALYPTUS SP. *Myrtaceæ*.** A magnificent timber for ship-building, and a favourite wood for house carpentry; not nearly so hard or heavy, and not so durable as the iron-barks. *COURANGA. Blue Gum of Coast Districts.* D. 40—72. H. 100—160.

**EUCALYPTUS SP. *Myrtaceæ*.** Very valuable, harder, closer, and more inlocked in grain than the last; excellent for naves and felloes of wheels, and for work under ground. The minute grub holes often found in this and other varieties of Eucalyptus are not symptoms of general decay. *TJELLAT ZARRAH. Blue Gum of Camden.* D. 36—48. H. 70—100.

**EUCALYPTUS SP. *Myrtaceæ*.** An excellent gum timber. *MAANDOWIE. Grey Gum.* D. 24—48. H. 60—100.

**EUCALYPTUS SP. *Myrtaceæ*.** A magnificent timber tree, in very high repute for wheelwrights' work. *GNAOULIE. Woolly Butt of Illawarra.* D. 36—72. H. 100—150.

**EUCALYPTUS SP. *Myrtaceæ*.** A good hard-wood timber. *BURRAM-BURRANG. Rough-barked Gum.* D. 36—48. H. 80—90.

**EUCALYPTUS MEDIA. *Myrtaceæ*.** One of the very largest of the Eucalypti; the timber of excellent quality for house carpentry, or other purposes where

- strength and durability are objects. The compiler lately measured a specimen at Bullai, Illawarra, still in full vigour, and with no external symptoms of decay, 41 feet in circumference, with the bole of immense height. *YARR-WARRAH. Black Butt Gum.* D. 36—72. H. 100—130.
- EUCALYPTUS* SP. *Myrtaceæ.* Of no value for timber, but excellent for fuel. *Lead-coloured Gum.* D. 18—30. H. 30—40.
- EUCALYPTUS* SP. *Myrtaceæ.* Said to produce good timber. *Red Gum.* D. 24—40. H. 40—80.
- EUCALYPTUS* SP. *Myrtaceæ.* A fine timber tree, very like stringy-bark, excepting towards the butt. *WARREKAH. Messmate.* D. 36—60. H. 80—130.
- EUCALYPTUS* SP. *Myrtaceæ.* A useful timber for inside work, but not equal to the better sorts of Eucalypti in strength or durability. *BURRAH MURRA. Swamp Mahogany.* D. 36—60. H. 60—100.
- EUCALYPTUS* SP. *Myrtaceæ.* A noble timber tree, the wood much prized for its strength and durability. *BOOH. Mahogany.* D. 36—60. H. 60—130.
- EUCALYPTUS* SP. *Myrtaceæ.* A distinct variety. *Stringy-bark, Appin.* D. 36—48. H. 70—100.
- ANGOPHORA* SP. *Myrtaceæ.* A fine tree, the largest of the genus, the connecting link between Angophora and the smooth-barked Eucalypti; timber applied to no useful purpose. *KAJIMBOURRA. Red Gum.* D. 36—70. H. 60—100.
- ANGOPHORA* SP. *Myrtaceæ.* Useful for naves of wheels and boards, but generally much deteriorated by gum veins. *YEH-DTHEDEH. Apple-tree of Coast.* D. 34—48. H. 40—60.
- C—SYNCARPIA* SP. *Myrtaceæ.* A magnificent tree, often measuring 20 to 30 feet in circumference, and with great length of bole, the timber valued for posts in timber fences, and said to be most durable under ground; very liable to rend in drying. *BOOBEEAH; KILLA WARRAH. Turpentine.* D. 59—100. H. 120—180.
- TRISTANIA NERIIFOLIA. Myrtaceæ.* A fine tree with lofty bole, timber very close-grained and elastic, much valued for boat-building; common at Illawarra high up the mountain, very difficult to season without rending. *OORAMILLY. Water Gum.* D. 24—48. H. 80—120.
- TRISTANIA* SP. *Myrtaceæ.* Much valued at Brisbane Water for knees and ribs of boats; quite distinct from the preceding three species. *Water Gum.* D. 12—24. H. 30—50.
- MELALEUCA STYPHELIODES. Myrtaceæ.* The timber of this and the two following species of Melaleuca appear to possess the same qualities. It is hard, close, rends very much in seasoning, but is said to be almost imperishable under ground. The outer bark can be easily detached in innumerable thin layers, very soft to the touch. The leaves in No. 100 contain, in common with several other species of humbler growth, an essential oil, which, when extracted by distillation, is only distinguishable by the colour from the "Cajeput." *NAAMBARR. Prickly Tea-tree.* D. 18—36. H. 40—80.
- ACMENA ELLIPTICA. Myrtaceæ.* Beautiful tree with dense foliage, producing a profusion of fruit in clusters, very acid, but eatable and wholesome; wood close, apt to rend in drying. *TDJERAIL. Lily Pily.* D. 24—36. H. 60—80.
- ACMENA. Myrtaceæ.* At Illawarra occasionally a fine tree, but generally branching low and attaining no size; wood exceedingly hard, close, and heavy, formerly much used by the aborigines for their offensive weapons. Common in almost every rocky ravine east of the Blue Mountains. *KANGLOON. Myrtle.* D. 12—40. H. 33—80.
- STENOCARPUS SALIGNUS. Proteaceæ.* A tree with very sparse foliage, the only Proteaceous tree common in cedar brushes; produces wood of great beauty, which promises to be useful for veneers in cabinet work. *MELEYN. Beef Wood; Silky Oak.* D. 18—36. H. 50—80.
- ACACIA* SP. *Fabaceæ.* One of the largest of the genus—in some of the brushes attaining the stature of a fine timber tree, remarkable for its narrow sparse phyllodia and rugged bark; wood very handsome, tough, and light, excellent for axe helms and bullock yokes. *MARRAI-OO. Sallow.* D. 12—36. H. 40—80.
- ACACIA PENDULA?* *Fabaceæ.* A species well known for its violet-scented wood, common on the open sheep pastures in the interior. *Myall.* D. 9—18. H. 30—30.
- CASUARINA* SP. *Casuarinaceæ.* Usually found in groups or small detached dense thickets in moist places, or "open forest ground"; wood much used for purposes in which lightness and toughness are required. *COOM-BAN. Forest Swamp Oak.* D. 12—30. H. 40—70.
- TEOCHOCARPA LAURINA. Epacridaceæ.* Small tree, generally of crooked growth; wood very close-grained, useful for turning and other purposes

- demanding a tough fine-grained wood; requires to be seasoned carefully.
- BARRANDUNA.** *Beech Brush Cherry*. D. 10—16. H. 20—30.
- CRYPTOCARYA OBOVATA.** *Lauraceae*. A magnificent tree, producing a soft, white, but useful wood. **MYNDEE.** *White Sycamore*. D. 24—60. H. 80—130.
- CRYPTOCARYA SP.** *Lauraceae*. A handsome brush tree; the wood more beautiful than most of the *lauraceae*. D. 12—30. H. 50—80.
- CRYPTOCARYA SP.?** *Lauraceae*. A tree of noble dimensions, in general habit resembling *Cryptocarya obovata*, but with smaller leaves; wood soft, light, in request for decking small craft. The local name would seem to be a corruption of *Flindersia*, with which, however it has no affinity. *Flindosa*.
- ENDIANDRA GLAUCA.** *Lauraceae*. A noble tree, with lofty cylindrical stem, and simple head; wood hard, close, and fine in grain, duramen dark-coloured, and frequently very handsome, with a powerful aromatic fragrance throughout; common at Brisbane Water, and said to be a very valuable timber. **MURREOGUN.** *Teak Wood*.
- DORYPHORA SASSAPRAS.** *Atherospermaceae*. A charming tree, with dense, bright glossy foliage and aromatic odour, filling the brushes with the most delicious fragrance. Infusions of its aromatic bark in repute as a simple tonic. Wood soft, weak, and of little repute. **TDJEUNDEGONG; CAALANG.** *Sassafras* or *Sassafras*. D. 24—36. H. 80—120.
- CARGILIA SP.** *Ebenaceae*. A much finer tree, and with tougher wood; produces large quantities of small fruit, eaten by the aborigines; wood in repute for strength and toughness. **CAARAMBOOL.** *Grey Plum*. D. 12—24. H. 30—40.
- PITTOSPORUM UNDULATUM.** *Pittosporaceae*. A small tree, with very close-grained, hard, white wood, which when, seasoned carefully, is excellent for turning, and promises to be good for wood-engraving; sound transverse sections of more than 10 to 16 inches would be rare. **WALLANDUN DETREN.** D. 18—30. H. 50—80.
- APHANOPETALUM SP.** *Cunoniaceae*. A noble tree of great beauty, producing in terminal racemes large quantities of acid fruit; wood close-grained and easily worked; likely to be useful. **TDJEUNEN.** *White Myrtle; Blue Ash; Ash*. D. 30—48. H. 80—120.
- CERATOPETALUM APETALUM.** *Cunoniaceae*. A beautiful tree, with elongated cylindrical stem; wood soft, light, close-grained, of agreeable fragrance; good for joiners' and cabinet work; much in request for coach-building. **BOOLA; NGNAAREWING.** *Light Wood; Leather Jacket; Coach Wood*. D. 24—40. H. 80—128.
- PODOCARPUS SPINULOSUS.** *Taxaceae*. A fine tree with elongated trunk, rarely cylindrical; wood free from knots, soft, close, easily worked, good for joiners' and cabinet work, some trees affording planks of great beauty; common from latitude 35° to 24°. **DYRREN DYRREN.** *Pine; White Pine*. D. 25—60. H. 70—130.
- EPICARPURUS SP.** *Moraceae*. Small tree, of elegant upright growth, with bright glossy, very rigid, nettle-shaped leaves; wood hard, close-grained, tough, and firm; common at Illawarra. **MANRULANG** *Rough Fig*. D. 8—16. H. 30—50.
- Genus unknown. *Rhamnaceae*. A noble tree, with a magnificent canopy of foliage, and lofty erect cylindrical bole; wood very close, firm, and hard, evidently a serviceable wood, found at Illawarra and at Brisbane Water. D. 24—43. H. 60—120.
- MYRSINE SP.** *Myrsinaceae*. Handsome, small, slender tree, with prettily-grained, white wood. D. 8—14. H. 25—40.
- VITEX SP.** *Verbenaceae*. A noble tree, the wood of which is said never to shrink in drying; much prized for the decks of vessels. **COO-IN-NEW.** *White Beech; Beech*. D. 36—70. H. 80—120.
- ELÆOCARPUS SP.** *Tiliaceae*. A noble timber tree; the wood light and tough, used for oars and other purposes requiring lightness and toughness. **YANDER-AIRY.** *Mountain Ash*. D. 24—60. H. 80—130.
- MYRTUS BECKLERII.** F. MUELL. *Myrtaceae*. From 60 to 80 feet in height, about 2 feet in diameter, umbrageous and graceful in appearance; timber of a reddish colour when fresh, becoming pale when dry, said to be durable. Tree very plentiful. **GINUGAL.** Ballina, Richmond River.
- CRYPTOCARYA SP.** *Lauraceae*. A tree of general occurrence in the cedar brushes, timber hard and durable, and may be obtained of considerable size; but not used by settlers. **GOOROLE.** Richmond River.
- CRYPTOCARYA SP.** *Lauraceae*. A magnificent tree in size and appearance, attaining a height of 100 feet, and from 3 to 4 in diameter. Timber of great durability. **GULGI.** Richmond River.
- LOPHOSTEMON AUSTRALIS.** *Myrtaceae*. Attaining a height of 100 feet, and 4 to 4 feet in diameter; one of the most valuable timbers in the Colony, on

- account of its durability ; it is averred on credible authority that instances are known of this timber remaining perfectly sound after being nearly thirty years worked up as ribs of vessels. *GERIA. Brush, Bastard or White Box.* Port Stephens to the Tweed ; plentiful within the coast range in open forests as well as in brushes.
- NELITRIS* SP. *Myrtaceæ*. This fine tree occurs only on the coast, in situations facing the sea, where it attains a height of from 70 to 80 feet, and from 3 to 4 feet in diameter. Its timber has been used for ship-building purposes, but on account of its hardness is now seldom employed. It is very close-grained, and when fresh is quite red in colour. Very plentiful. *Burranna.* Richmond River, near Ballina.
- FRENELLA VERRUCOSA* VAR *LÆVIS.* *Conifera*. The root of this tree is valued by cabinet-makers for veneering purposes, and largely employed in this way some years ago ; but from some cause, not explained, it seems to have fallen into disuse. It attains a height of about 60 feet, and from 18 inches to about 2 feet in diameter. *COORONG. Cypress Pine.* Near the coast, at the mouth of the Richmond and Clarence ; plentiful.
- CRYPTOCARYA*? SP. *Lauraceæ*. A magnificent tree, from 80 to 100 feet in height, and 3 to 4 feet in diameter. Abundant in the brushes. Timber of apparent value, but not used for any purposes by settlers. *MENEM.* Ballina, Richmond River.
- ARAUCARIA CUNNINGHAMII.* *Conifera*. This noble tree bears the same aboriginal name as the cypress pine ; it grows in the greatest profusion in all the brush forests on the Richmond ; the timber from the inland or mountain brushes is preferred to that from the coast. It is exported to Sydney and elsewhere in large quantities, the sawyers receiving at the present time 2*l.* 10*s.* per thousand feet. Some trees will yield as much as ten thousand feet of saleable timber. Spars for ships may be obtained in any quantity, from 80 to 100 feet in length. In some instances the tree attains a height of at least 150, and from 4 to 5 feet in diameter—much smaller on the Clarence, where it is also in less abundance. *COORONG. Moreton Bay Pine.* Richmond river, in brush forests.
- FLINDERSIA AUSTRALIS.* *Cedrelaceæ*. A large-sized tree of very general occurrence in the northern districts ; from 80 to 100 feet in height, and from 2 to 4 feet in diameter. Timber valuable for staves, for which purpose it is extensively used in the Clarence district. *WYAGERIE* or *CUGERIE. Ash, Beech, and Flindosa.* Clarence and Richmond.
- CUPANIA AUSTRALIS.* *Sapindaceæ*. This tree, remarkable for its large and singular foliage, attains a considerable size on the Clarence, from 60 to 80 feet in height, and as much as 3 feet in diameter ; is valued by the settlers on account of its sub-acid fruit, which it yields in great abundance, and of which a very good preserve is made. Timber, although compact and durable, seldom used. *ACOULOY.* *Native Tamarind.* All along the coast in brushes, a common inhabitant.
- CASTANOSPERMUM AUSTRALE.* *Fabaceæ*. A very beautiful and magnificent tree, the principal occupant of many extensive forests in the localities referred to. On the table-land of the Richmond it attains the height of at least 130 feet, and from 5 to 6 feet in diameter. Although the timber is dark and prettily grained, not unlike walnut, yet it is seldom used for any purpose ; if durable, it is worthy of attention. It is sometimes split for staves. *IRITALIE. Moreton Bay Chesnut, or Bean Tree.* Richmond and Clarence brushes ; abundant.
- AILANTUS*? SP. *Xanthoxylaceæ*. A good-sized tree ; timber not used. *AGUNDI-GUNDIE.* Clarence. Plentiful near Grafton.
- Genus? *Ebenaceæ*. Very abundant. A fine tree of large growth, attaining a height of 100 feet, and 2 to 3 feet in diameter ; somewhat rigid in habit. Timber soft when fresh, but so tough as to admit of its fibres being worked into a rope without breaking ; said to be durable. Worthy of particular notice. *ULLA WABBIE. Black Myrtie.* Clarence River brushes.
- BALOGHIA LUCIDA.* *Euphorbiaceæ*. Frequent on the coast ; abundant on the Clarence. A good-sized tree. Timber not used. *NUN NALIA.* Clarence River.
- SYNŌUM GLANDULOSUM.* *Meliaceæ*. One of the largest trees in the district in which it is found, varying in height from 70 to 100 feet, and from 4 to 5 feet in diameter. Timber when fresh of a deep red colour, emitting a scent similar to the common rose. Used for cabinet purposes, for which it has long been highly valued, as well as for the inside lining of houses and ship-building. *MOCONDIE. Rose-wood.* Open forest brushes on the Clarence and Richmond.
- SYNŌUM LARDNERI* (MOORE). *Meliaceæ*. Plentiful ; a fine tree, called by the aborigines by the same name as the Rose-wood, No. 47, but from which it is very different ; timber red when fresh, without scent, similar in appearance and in the grain to the cedar used for pencils ; hence the name : the bark smells some

- what like a Swedish turnip; employed in house work and general purposes. *MOCOUNDIE. Pencil Cedar; Turnip Wood.* Clarence and Richmond brushes.
- SUPANIA ANACARDIODES. Sapindaceæ.* Abundant; this tree attains a height of 70 or 80 feet in good situations, and 18 inches to 2 feet diameter; timber occasionally used for house-building purposes, but not highly valued. Clarence and Richmond brushes.
- FLINDERSIA GREAVESII. (MOORE). Cedrelaceæ.* A magnificent tree, the monarch of the northern forests, attaining a height of 150 feet, 3 to 6 feet in diameter, distinguishable from every other species of the genus by its dark brown and rough scaly bark, as well as by other characters; timber used for house-building purposes. *WYAGERIE. Flintamendosa.* Mountain brushes on the Clarence.
- CALLISTEMON SALIGNUM. Myrtaceæ.* A tree of moderate size; timber used for posts in damp situations, as it stands well in water. *UNOYIE. Tea-tree.* In moist situations; Clarence and Richmond.
- ALPHITONIA EXCELSA. Rhamnceæ.* Of general occurrence along the coast: a fine tree, often attaining a height of 100 feet; timber dark when old; used for various purposes in the Southern districts, but not valued on the Clarence. *NONO GWYINANDIE.* Clarence River brushes.
- ANGOPHORA SUBVELUTINA. F. MÜLL. Myrtaceæ.* A fair-sized tree; timber very strong and durable; used for posts and rails. *ILLAREGA. Apple-tree.* Clarence and Richmond open forest country; abundant.
- MYRTUS ACMENOIDES. F. MÜLL. Myrtaceæ.* A fine tree, from 60 to 70 feet in length, and from 2 to 3 feet in diameter; timber very hard and durable, but seldom used. *White Myrtle.* Brush forests on the Clarence and Richmond.
- ACACIA SP., NEAR CUNNINGHAMII. Fabaceæ.* A moderate sized tree, timber dark, suitable for cabinet work. Seldom used. *Bastard Myhill?* Clarence and Richmond open forests.
- ACRONYCHIA HILLII. F. MUELL. Aurantiaceæ.* A small-sized tree; timber not used. Clarence brush forests.
- EUCALYPTUS SP. Myrtaceæ.* This well known tree attains a very large size in the Northern districts, upwards of 100 feet in height, and as much as 5 feet in diameter. Timber very highly valued for its unequalled strength and durability; it is used for all kinds of fencing, shingles, beams, dray poles, plough beams, and various other purposes; when properly seasoned it will not shrink. Apparently distinct from the iron-bark of the south. *ALGEREGA. Iron-bark of the Clarence.* Open forest country; abundant on the Clarence river.
- OWENIA VENOSA. F. MUELL. Sapindaceæ.* This very handsome foliated tree, which occurs in most of the northern brush forests, is well worthy of attention on account of its timber, which is exceedingly strong, and very highly coloured with different shades from black to yellow; it takes a good polish, and is used for cabinet work. *MOULIBIE. Tulip-wood.* Clarence River brush forests.
- PETALOSTIGMA QUADRILOCULARE. F. MUELL.* A low-sized tree, with somewhat pendulous branches. Timber not used for any purpose. Open forest country, invariably adjoining brush lands.
- EUCALYPTUS SP. Myrtaceæ.* Plentiful on the Clarence. This timber is extensively used for building purposes, such as scantling, battens, flooring boards, and for posts, rails, ships' planks, &c.; it is often 7 feet in diameter, with a stem, without knot or flaw, of from 70 to 80 feet in length. Many trees yield from 6,000 to 8,000 feet of timber, which is worth at the present time 18s. per 100 feet; its specific gravity is said to be less than any of the other gums.
- UMBAGGA. Flooded Gum.* Near watercourses, or on rich deep alluvial soil, in many parts of the colony.
- EUCALYPTUS SP. Myrtaceæ.* Plentiful in the Clarence district. This is little, if at all, inferior in size to the preceding; its timber is, however, harder and more durable, but is used for the same purposes, and is of the same market value. *Grey Gum.* On strong stiff alluvial soils throughout the colony.
- RHUS RHODANTHEMUM. F. MUELL. Anacardiaceæ.* A good-sized tree; timber sound and durable, of a light-yellow colour, close-grained and beautifully marked; will take a fine polish, and is one of the most suitable timbers in the colony for cabinet work. *Light Yellow Wood.* Richmond brush forests; plentiful near Richmond.
- GREVILLEA ROBUSTA. Proteaceæ.* This tree grows to a moderate size, and is very general in the northern districts. Timber extensively used for staves for tallow casks, and is, in consequence, becoming very scarce. *WAHRA-GARRIA. Silky Oak.* General in the Clarence and Richmond brush forests.
- LOPHOSTEMON SP. Myrtaceæ.* This fine tree, and a variety called forest mahogany, grows to a large size, and is very plentiful near Grafton; its timber is found to be very durable in wet situations, and is therefore useful for posts or sleepers;

it is easily worked, but possesses the property in an unusual degree of blunting the edges of tools, and is therefore, no great favourite with sawyers. *URCANGA. Swamp Mahogany.* Open forest country in the Clarence district.

**CEDRELA AUSTRALIS.** *Cedrelacea.* The timber of this best known and perhaps the most valuable tree the Colony possesses, is used very largely for all kinds of purposes; it is easily worked, and in dry situations very durable. A good specimen of this wood is equal in quality to the best mahogany, to which it is very similar in appearance. The tree grows to an enormous size on the tableland of the Richmond, from which and the adjoining district of the Tweed the principal supply is now obtained. A tree of this, lately cut down near Lismore, measured 10 feet in diameter at the base, and was calculated to yield 30,000 feet of saleable timber. **WOOLIA.** *Red Cedar.* In thick brush forests within the coast range.

**Iron-bark timber.** Exposed for three years in salt water. Turpentine timber. Exposed for nine years in salt water. Exhibited by Shoober, James, Sydney Exchange, to show the quality these timbers possess of resisting the attacks of marine insects, &c.

1 piece of timber, from Bellinger River. Hodgson, George, Thanet Lodge, Redfern.

3 logs timber. Penzer, J., Bundamar, near Dubbo, Lower Macquarie. Very useful for station purposes.

Specimens of timber from Mount Victoria. Du Faur, E., Rialto Terrace, Sydney. Specimens of Cedar.)

Iron-bark.

Tallow wood.

Blackbut.

Blue gum.

Spotted gum.

Hudson Bros., Botany Road, Redfern.

2 pieces scented Myall (*Acacia pendula*). Used for pipe bowls. Stock-whip handles, and occasionally for incense. Exhibited by E. S. Hill, Point Piper.

Pressed ferns. Mrs. Harling and H. H. Field, Clarence Street, Sydney, New South Wales.

#### CLASS 605.

Quondong Nuts. Derepas, R., Youngara.

Copra (dried cocoa-nut). Hennings, F. W., Loma Loma, Fiji.

Copra (dried cocoa-nut). Ryder, Bros., Mango Island, Fiji.

Seed of *macrozamia denisonii*.

Seed of *castanospermum Australe*.

Ginger root.

*Alstonia constricta.* The New South Wales Commissioners.

Medicinal bark, used in the northern parts of New South Wales as a specific against fever and ague. Armstrong, A., Bridge Street.

#### CLASS 620.

Maize. Lovegrove, W., Terrara, Shoalhaven River.

Maize. Ryder Brothers, Mango Island, Fiji.

Maize. Peden, M. J.

Maize. Demestre, E., Shoalhaven.

Maize. Small red core in cob and thrashed. Eggins, James, Grafton, Clarence River.

Maize, golden drop. By Eggins, James, Grafton, Clarence River.

Maize, early white and golden drop. By Blain, C. R. Grafton, Clarence River.

Flat maize.

Ninety-day maize. } New South Wales Commissioners.

{ Large yellow flint maize.  
 { Small yellow flint maize.  
 { Earliest French maize. } Sir William Macarthur, Camden Park.

Sorghum.

Imphee.

Buckwheat.

Sir William Macarthur, Camden Park.

White German millet.

Yellow Italian millet.

Canary seed.

Sir William Macarthur, Camden Park.

Wheat, 50 lbs. Lewis Bros., Tamworth.

Wheat, 1 peck. Dalton Bros., Orange.

Wheat, 1 bag. Nelson Bros., Orange.

## CLASS 621.

Beans. Ryder Bros., Mango Island, Fiji.

Canadian wonder bean.

Large haricot bean.

Haricot bean.

Rice haricot bean.

Canterbury bean.

White lupin.

Laxton's William the 1st pea.

Laxton's popular pea.

Laxton's superlative pea.

Laxton's omega pea.

Veitch's perfection pea.

Queen of Dwarf pea.

Blue field pea.

} Sir William Macarthur, Camden Park.

Tobacco leaf. 12 lbs. Dixon and Sons, York Street.

Tobacco. Manufactured from leaf grown in New South Wales (two samples).

Dixon and Sons, York Street, Sydney.

Tobacco Leaf. Grown on the Clarence River—cigar leaf. Jaeschke, Gustave.

✶ Cigars. Manufactured by W. Schweigert & Co., from leaf grown in New South Wales.

Cigars. From leaf grown in the Clarence River District. Manufactured by Muirhead, R., Grafton, Clarence River.

Cigars, from leaf grown in the Clarence River District. Manufactured by Jaeschke, Gustave, Grafton, Clarence River.

## CLASS 651.

Preserved milk, in a condensed form, prepared by a new process. The inventor —Seccombe, R., Milton, Ulladulla, New South Wales.

✶ Leather. Sole, yearling runners, horse tweed, waxed calf, waxed splits, waxed wallaby skins, waxed kangaroo skins, enamelled kangaroo skins, russet kangaroo skins. Wright, Davenport, & Co., 5, Barrack Street, Sydney.

Leather. Sole. J. Forsyth, and Sons, Paramatta Street, Sydney.

✶ Leather. Japanned, enamelled, kangaroo skins, japanned kangaroo skins, levant kangaroo skins. Alderson and Sons, Elizabeth Street, Sydney.

Tallow. Bell, H., Sydney.

Tallow. Hewitt, T. G., Grafton, Clarence River.

Neat's foot oil. Bell, H., Sydney.

Neat's foot oil. Berry, J. S., Gany, Sydney.

Neat's foot oil. Hewitt, T. G., Grafton.

Glue. Manufactured by Berry, J. S., Botany.

## CLASS 654.

Beeswax, prepared. Layton, Fred., Grafton, Clarence River.

## CLASS 656.

✶ Preserved meats:

12 2-lb. tins boiled beef.

6 6-lb. tins boiled beef.

6 6-lb. tins boiled mutton.

12 4-lb. tins boiled beef.

12 4-lb. tins boiled ox tongues.

The Sydney Meat Preserving Company, Margaret Street, Sydney.

✶ Preserved pine apples, 5 tins.

✶ Canned Fruits.

} Grown and prepared by Camille Hoff.

Specimens of a few of the kinds of lemons and oranges grown in New South Wales:

Navel oranges, common orange, Siletta orange, Seville orange, Mandarin,

Poor man's, Maltese blood, Lisbon lemon, Bergamot lemon, citrons, preserved by Messrs. Biddell, Brothers, George Street, Sydney.

Bergamotte lemon, Lisbon lemon, Navel orange, Parramatta orange, Queen's orange, Graham's seedling orange, Rio orange, St. Michael's orange, Pye's seedling orange, Seville orange, Siletta orange, Thorny mandarin, Cumquat orange, Canton mandarin orange, Emperor mandarin orange. Preserved by J. L. Lackersteen, Sydney.

## Fruits preserved—

In water.	In sugar.	Jam.	Jellies.
Apricots.	Oranges.	Apricot.	Apricot.
Apples.	Apricots.	Peach.	Quince.
Peaches.	Peaches.	Quince.	Loquat.
Pears.	Pears.	Mulberry.	Apple.
Quinces.	Quinces.	Apple.	Peach.
Mulberries.	Mulberries.	Nectarine.	
Plums.	Nectarines.	Pear.	
Nectarines.	Apples.		

Preserved and exhibited by Elam Squires, Penrith.

## CLASS 657.

- P Flour. Watson Bros., Young.  
 P Flour. Lewis Bros., Tamworth.  
 Flour. Cohen & Levy, Tamworth.  
 P Flour. Dalton Bros., Orange.  
 Flour. Nelson Bros., Orange.

## CLASS 658.

- P Arrowroot. Waters, James, Ravensdale, Brisbane Water.  
 P Arrowroot. Cole, W., & Son, Tomago, Hunter River.  
 P Arrowroot. Laurie, A. L., Rawdon Vale, Gloucester, Port Stephens.  
 Arrowroot. Ryder Bros., Mango Island, Fiji.  
 Arrowroot. Payne, George, Grafton, Clarence River.  
 Arrowroot. } Champion, George, Ulmarra, Clarence River.  
 Maixena { 2 cases, 1 lb. packages } Munn, A. L., Merimbula.  
 { 1 case, ½ lb. packages }  
 Raw sugars. Manufactured from cane grown at the Clarence River. Colonial  
 Sugar Refining Co., New South Wales.  
 P Refined sugars. Produced at the Refinery of the Colonial Sugar Refining Com-  
 pany, New South Wales.  
 Sugar. Martin, George, Grafton, Clarence River.  
 Sugar. Chowne, E. G., Ulmarra, Clarence River.  
 Sugar. Chowne, E. G., Ulmarra, Clarence River.  
 P Confectionery. 36 jars. Made of New South Wales sugar, by Biddell Bros.,  
 Sydney.

## WINES.

Variety of Grapes.	Vin- tage.	Colour.	Character.	Price.	Information as to soil, aspect, &c.
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Grower, Jas. T. Fallon. Locality, Albury.

P	Verdeilho	-	1872	White	Full-bodied	-	gals. 8/ doz. 25/
	Ancarot	-	1872	"	"	-	8/ 25/
	Hermitage	-	1870	Red	"	-	7/8 24/
	Tokay	-	1870	White	Light	-	8/ 25/
	Shiraz	-	1871	Red	Full	-	7/8 24/
	Brown muscat	-	1870	Pink	"	-	8/ 25/
							} Red chocolate soil; volcanic.

Grower, A. Munro. Locality, Bebeah, Singleton.

P	Shiraz	-	1872	White	Light-bodied	5/ to 6/	15/ to 18/
	Pineau	-	1873	"	"	"	"
	"	-	1874	Yellow	Medium	"	"
	Lambrequat	-	1873	Red	Full-bodied	"	"
	Verdot	-	1874	"	Light	"	"
							} Heavy black earth.
							} Light red sand.
							} Rich loam.

Growers, G. L. &amp; J. B. Carmichael. Locality, Porphyry, William River.

	Verdeilho	-	1866	White	Full-bodied	-	10/ 30/
	Reisling	-	1869	"	"	-	10/ 30/
	Verdeilho	-	1869	"	"	-	10/ 30/
	Reisling	-	1870	Light	"	-	6/ 20/
	Verdeilho	-	1872	"	"	-	8/ 25/
	Reisling	-	1872	"	"	-	6/ 20/
							} Alluvial, with clay subsoil; aspect north-east.

Variety of Grapes.	Vintage.	Colour.	Character.	Price.	Information as to soil, aspect, &c.
--------------------	----------	---------	------------	--------	-------------------------------------

Grower, Carl J. P. Brech. Locality, Rosemount, Denman.

P {	Muscatel	-	1873	White	Full-bodied	-	8/	-	} Sand and loam.
	Shepherd Reising	-	1875	"	Light	-	4/6	-	
	Hermitage	-	1874	Red	Full-bodied	-	7 6	-	
	"	-	1875	"	"	-	5/	-	
	"	-	1870	"	"	-	Not for sale	-	
	Shepherd Reising	-	1872	White	Light	-	-	30/	

Grower, Edward Powell. Locality, Richmond.

Muscate & a few black hambro'.	1869	White	Full-bodied	-	20/	Alluvial soil on the banks of the Hawkesbury.
--------------------------------	------	-------	-------------	---	-----	---

Grower, Montague Parnell. Locality, West Maitland, Hunter River.

Reising	-	1868	Light	Fine old wine	-	30/	} Hilly, limestone, north-west.
Madeira	-	1873	Amber	Full-bodied	-	24/	
Reising	-	1873	Golden	"	-	24/	
Madeira	-	1874	"	"	-	24/	

Grower, Wadham Wyndham. Locality, Bakkulla, Inverell.

P {	Hermitage	-	1872	Red	Full-bodied	-	10/	40/	} Red chocolate soil, impregnated with ironstone gravel.
	Malbec	-	1872	"	Light	-	10/	40/	

Grower, George Wyndham. Locality, Fernhill, Brauxton, Hunter River.

Pineau	-	1873	White	Full-bodied	-	4/ to 6/	16/ to 20/	} Deep sandy loam (poor), producing light crops; producing about 300 gallons per acre.
Bergundy	-	1873	Red	"	-	"	"	
Hermitage and	-	1872	"	"	-	"	"	
Malbec.	-	-	"	"	-	"	"	
American black Isabella.	-	1873	"	Medium	-	"	"	

Grower, J. F. Doyle. Locality, Kaludah, Lochinvar.

P {	Verdielho	-	1873	White	Light	-	25/ per doz.	-	} Chocolate soil, with volcanic rock sub-soil.
	Reising	-	1873	"	"	-	"	-	
	Hermitage	-	1873	Red	"	-	"	-	

Malt Vinegar, } Monk, D. J., Sussex Street, Sydney.  
Wine Vinegar. }

Bottled Ale, 1 dozen.  
Bottled Porter, 1 dozen. } Marshall, J., Paddington Brewery.

P Aërated Waters and Cordials. Barrett & Co., Sydney.

P Twenty-four samples of biscuits varying in weight from 12 to 17 lbs. each.  
Manufactured by Hardie, John, George Street, Sydney.

#### CLASS 662.

Castor Oil. Prepared by exhibitor from seed grown on the Clarence River, New South Wales. Layton, Fred., Grafton, Clarence River.

#### CLASS 665.

Cotton, South Sea Island Cotton. Hennings, F. and W., Loma Loma, Fiji.

P Cotton, South Sea Island Cotton. Ryder Brothers, Mango Island, Fiji.

Cotton, 1 show glass. Grown and prepared by Hoff, M. Camille, Nakutakina, New Caledonia.

No. 1. Fibre of *Doryanthes excelsa*, or Gigantic Lily of colonists. This amaryllidaceous plant grows in great abundance in various parts of the coast districts, north and south of Sydney. It yields a valuable fibre of a fine quality.

No. 2. Fibre of *Gymnostachys auceps*, Travellers' Grass of colonists. This aroidaceous plant is very common along the coast districts of New South Wales, and its leaves are extensively used by settlers for tying purposes. This yields a fibre of such strength that it requires a strong man to break a portion of a leaf half an inch in breadth.

No. 3. Fibre of *Eurcra gigantea*. This South American amaryllidaceous plant is well suited for cultivation in New South Wales. It yields a strong and durable fibre, and might be grown for this quality on poor soils when not wanted for any other purpose.

- No. 4. Fibre of *Fourcroya cubensis*. A Cuban amaryllidaceous plant, which yields an excellent fibre and grows most luxuriantly in New South Wales.
- No. 5. Fibre of *Agave americanum*. This well known American aloe, which produces such an excellent fibre and of such strong and durable quality, is well suited for cultivation for its fibre alone. It will grow in almost any situation, and so freely that under favourable circumstances it will flower in from seven to eight years.
- No. 6. Fibre of *Musa sapientum*, or Common Plantain. This plant, so generally planted in New South Wales for its fruit, yields a fibre second only in value of its kind to that of the Manila hemp, which is obtained from *Musa textilis*.
- No. 7. *Commersonia echinata*, Brown Kurrajong of colonists. The fibre of this tree is of a very tenacious nature, and is preferred to all others by the aborigines for making nets.
- No. 8. Fibre of *Sterculia lurida*, Sycamore of colonists. This fibre is the inner bark of the tree. When fresh it has a lace-like character, and is in consequence made up into a variety of fancy articles by the colonists. Moore, Chas., Director of Botanic Gardens, Sydney.
- Fibre of Gigantic Nettle Tree (*Urtica Gigas*), with dilly-bag manufactured from it by Australian aboriginal. This tree is very abundant on the Macleay and other northern rivers, and is easily converted into material for strong cordage. Rudder, E. W., Kempsey.

Breeder.	Brand.	Breed.	Description.
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## WASHED WOOL.

## COMBING.

P	{	E. K. Cox, Mudgee	-	-	XE	Saxon Merino	Fine combing	- A
		Do.	-	-	in diamond.	do.	do.	- B
		Do.	-	-	do.	do.	Second combing	- C
P	{	G. H. Cox, Mudgee	-	-	GX	do.	Fine combing	- A
		Do.	-	-	in diamond.	do.	Second combing	- B
		F. & A. Cox, Mudgee	-	-	FAX	do.	Fine combing	- A
P	{	Do.	-	-	in diamond.	do.	do.	hoggets B
		Lamb & Roberts, Mudgee	-	-	IXL	do.	do.	- A
		Do.	-	-	in diamond.	do.	do.	hoggets.
P	{	E. & A. Tindal, Barraeran	-	-	CY	Merino	do.	- A
		Clive & Hamilton, Collaroy	-	-	-	do.	do.	- B
		Do.	-	-	GB	Saxon Merino	do.	hoggets.
P	{	J. B. Bettington, Merriwa	-	-	do.	do.	do.	hoggets.
		Do.	-	-	AL	Merino	do.	ewe hogts. A
		Andrew Loder, Colley Creek	-	-	Colley Ck.	do.	do.	rams - B
P	{	Do.	-	-	PELM	do.	do.	- A
		P. G. King, Peel River Co.	-	-	Co.	do.	do.	hoggets B
		Do.	-	-	S x J	do.	do.	do.
P	{	Shanahan & Jennings, Garrawilla.	-	-	-	do.	do.	hoggets A
		Henty & Balfour, Albury	-	-	-	do.	do.	do.
		Do.	-	-	-	do.	Fine combing	- A
P	{	Livingston Learmonth, Groongal.	-	-	-	do.	do.	- B
		Do.	-	-	-	do.	do.	hoggets.
		F. B. White, Blandford	-	-	FEW	do.	do.	do.
P	{	Do.	-	-	SM'C	do.	do.	do.
		Saml. McCaughey, Coonong	-	-	SKS	Rambouillet	do.	do.
		D. H. Campbell, Cunningham Plains.	-	-	□	Merino	do.	do.
P	{	A. Wilson, Coree, Deniliquin	-	-	-	-	-	-

## CLOTHING.

A. Loder, Colley Creek	-	AL	Merino	-	Fine clothing, merino.
P. G. King, Peel River Co.	-	Colley Ck.	do.	-	do. do.
Shanahan & Jennings, Garrawilla.	-	PELM	do.	-	do. do.
D. H. Campbell, Cunningham Plains.	-	Co.	do.	-	do. do.
	-	S x J	do.	-	do. do.
	-	Garrawilla.	Rambouillet	-	do. do.
	-	SKS		-	

Breeder.	Brand.	Breed.	Description.
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## GREASY WOOL.

## COMBING.

P	J. B. Bettington, Merriwa	gB	Saxon Merino	Fine combing	- A
	Do.	do.	do.	do.	hoggets B
P	G. L. Lethbridge, Singleton	-	do.	do.	do.
P	E. K. Cox, Mudgee	XE	do.	do.	do.
	Do.	in diamond.	do.	do.	do.
	Clive & Hamilton, Collaroy	CY	do.	do.	do.
	Do.	do.	do.	do.	do.
P	E. B. Hume, Burrowa	Hume	do.	do.	ewes A
	Do.	do.	do.	do.	ram.
P	E. & A. Tindal, Barragan	T Bros. in shield. Barragan.	do.	do.	hoggets B hoggets.
	Do.	GB	do.	do.	do.
P	E. & A. Bowman, Rotherwood	in diamond, Rotherwood.	do.	do.	- - A
	Do.	-	do.	do.	- - B
	Do.	-	do.	do.	hoggets U
P	F. R. White, Blandford	FEW	do.	do.	- - A
	Do.	do.	do.	do.	hoggets B
P	T. Brown & Co., Tuppal	-	do.	do.	do.
P	Livingston Learmonth, Groon- gal.	-	do.	do.	do.
P	P. H. Gell, Euston	KI	do.	do.	ewes.
	A. N. Gilbert, Warwillah	Warwillah	do.	do.	do.
	P. G. King, Peel River Co.	PELN Co.	do.	do.	- - A
	Do.	do.	do.	do.	hoggets B
P	J. L. Macdonald, Wallabadah	-	do.	do.	do.
	John Allen, Burrangong	JA	do.	do.	ewes.
P	D. H. Campbell, Cunningham Plains.	SKS	Rambouillet	do.	- - A
P	W. A. Brodribb, Moolbong	-	Merino	do.	do.
P	Simpson & Co., Bon Accord, Queensland.	Bon Accord in rising sun.	do.	do.	do.
	Do.	C	do.	do.	do.
	Shanahan & Jennings, War- breccan.	S x J	Merino	do.	- - A
	Do.	Warbreccan.	do.	do.	- - B
	D. Ramsay, Nanama	do.	do.	do.	do.
	Do.	Unicorn brand.	do.	do.	do.

## ADDITIONAL AWARD FOR WOOL.

P William Long.

## CLOTHING.

E. & A. Bowman, Rotherwood	GB in dmd	Merino	Fine clothing.
D. H. Campbell, Cunningham Plains.	SKS	Rambouillet	do.

P A. H. Lowe, Dynevor. Angora pure.

## CLASS 668.

P May, J. M.

P Asylum for Destitute Children, Randwick, near Sydney.

Silk Materials, from the grain to the manufacture, showing the cocoon, raw silk, organzine, grain, &c., produced by exhibitor, assisted by the inmates of the Asylum.

P Cocoons of Bombyx mori, and cards of eggs desiccated and pierced, grown at Claremont, Rose Bay Sydney, from Italian, Japanese, and Indian grain, Thorne, George, 90, Clarence Street, Sydney.

## CLASS 681.

Bone dust for manure. Exhibited by H. Bell, Sydney.

Bone dust for manure. Exhibited by J. S. Berry, Botany.

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**NEW ZEALAND.**

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COMMISSION from NEW ZEALAND to the INTERNATIONAL  
EXHIBITION, PHILADELPHIA, 1876.

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COMMISSIONERS.

Hon. WALTER BALDOCK DURANT MANTELL, M.L.C., F.G.S.,  
Chairman.

Hon. WILLIAM GISBORNE.

WILLIAM HORT LEVIN, Esq.

DANIEL MCINTYRE, Esq., United States Consul at Wellington.

*Representative Commissioner to Philadelphia.*

JAMES HECTOR, Esq., C.M.G., M.D., F.R.S.

*Secretary and Agent in charge.*

ARTHUR T. BOTHAMLEY, Esq.

## NEW ZEALAND.

In its relation to the INTERNATIONAL EXHIBITION at PHILADELPHIA,  
1876.

Prepared for the Commissioners by JAMES HECTOR, Esq., C.M.G.,  
M.D., F.R.S., Special Commissioner, Wellington, New Zealand,  
17th November 1876.

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### MEMORANDUM OF ACTION TAKEN BY COMMISSIONERS.

The Commissioners were appointed on 15th July 1875, and with the assistance of local committees collected a series of articles for exhibition under regulations and conditions which were published throughout the colony; all articles were collected at the expense of the Commissioners, and in most cases were either presented to, or purchased by them. The exertions of the Commissioners were unfortunately not well responded to, some of the most important and best developed districts of the colony displaying no interest in their being represented in the exhibition. In January 1876 the articles collected were shipped in charge of a special agent by the mail steamer to San Francisco, and thence trans-shipped by way of Panama and New York, so that they were not delivered in the exhibition building until the 20th April; meanwhile the Special Commissioner collected in London a large number of articles pertaining to the colony and arrived with them in Philadelphia on 23rd April.

Appointment of  
Commissioners  
in New Zealand.

Shipment of  
goods.

**Arrangement of exhibits.** The erection of the New Zealand court was at once commenced, and by the 10th May the exhibits were in place, although the final arrangement and cataloguing of the collection was not completed till the 10th June.

The Special Commissioner remained in charge of the court until the judges had completed their examination of the articles exhibited, and returned on 8th July to New Zealand, leaving an agent in charge for the remainder of the period during which the Exhibition was open to the public.

**Presentations to United States Government.** The majority of the articles exhibited were presented by direction of the Commissioners to the United States Government, and assigned to the different Public Museums.

#### DESCRIPTION OF THE NEW ZEALAND COURT.

**Dimensions of Court.** The New Zealand Court in the Philadelphia Exhibition was an oblong space, with 25 feet frontage to the main corridor that traversed the entire length of the building, and extending in depth 64 feet, so as to have a frontage to a second corridor. On the west side was the New South Wales Court, and on the east the Courts of Jamaica and Bermuda. The space was enclosed in an uniform manner with the other Australian courts, the Commissioners having joined in one design and contract (with the exception of Queensland) so that Australasia thus combined formed a striking feature in the Exhibition.

**Position.** The colouring was a delicate French grey, picked out with blue and black, and the courts were further decorated with flags and bannerets, affording bright points of colour that relieved the general neutral tint.

**Decoration.** Over the entrance was a Maori carving supported by taiahas and mats, and with the "Union Jack" over the New Zealand flag, which was supported on either side by the Stars and Stripes and Norwegian flags.

**Illustrations of gold mining.** Entering the court from the main corridor, in the centre was a handsome plate glass case 7 feet high and 4 feet wide with four glass shelves. This case was secured to the floor, and was specially fitted for the security of its valuable contents which comprised about 160 samples of golden sand, nuggets, and auriferous quartz specimens from the New Zealand goldfields. The samples were contained in glass and ebony cups and were marked in accordance with the printed catalogue which described their assay, value, and other qualities. Cards giving statistics of the goldfields were also placed in this case, and the intimate structure of the golden quartz was illustrated by a beautifully polished specimen exhibited through a large magnifying glass. This exhibit was of great interest to practical miners and mineralogists and attracted so much attention that a barrier was required to keep off the pressure of the crowd. In the upper part of the case were a series of models illustrating the mode of preparing the gold for export, and especially Miller's ingeniously simple process of removing the silver by the injection of chlorine gas into the molten gold.

**Miller's process for removal of silver from molten gold.**

**Statistics.** The statistics accompanying the gold stated that in 1874 there were 12,948 alluvial gold miners, producing gold valued at 6,470,315 dols., and 2,119 quartz miners, the value of whose production was 1,745,000 dols.

In the rear of the gold case was an iron safe to which the more valuable specimens were removed at night.

**Sketches and Photographs of colony.** On each side of the central space of the court was a screen 17 feet long covered with water coloured sketches and photographs of New Zealand scenery, by W. M. Cooper, Deveril, Burton, McCombie, and other artists of note in the colony; also sixty sheets of New Zealand ferns, mounted by Hay of Taranaki.

**Collection of ferns.** In the centre of the court was a huge gilt pillar, 25 feet high, representing the yield of the New Zealand goldfields since 1862. This pillar, which towered above every other object in this part of the building, represented the bulk of 246 tons of 23 carat gold, or 497 cubic feet, valued at 30,810,137., or 151,271,293 dols. gold, all of which information was written on the sides of the pillar in bold characters.

**Yield of gold since 1862.** In front of the pillar was a small relief map of New Zealand, modelled and geologically coloured by Dr. Hector.

**Minerals and timbers.** Still continuing down the centre of the court was a trophy of large blocks of coal and minerals, surmounted by tall glass cylinders of petroleum from the East Cape; also another trophy of polished timbers, some of the large slabs of kauri, resins, and totara being very attractive.

**Skeleton of moa.** Between these trophies and facing a side door was the skeleton of a large moa bird, lent by the Smithsonian Institute, and originally sent from the

Canterbury Museum by Dr. Von Haast. Continuing to the back of the section was a table case, 14 feet long and 7 feet wide, containing examples of hams, soap, candles, glue, grain, veneer timbers, tan barks, wine, beer, sauces, &c., and surmounted by a magnificent collection of all the varieties of kauri gum as sold in the American market, and eight different kinds of varnish which is made from it by Felton and Co. of Philadelphia.

Against the walls of the court on each side were three handsome upright cases of walnut wood alternately with ebonised table cases. In the first on either side of the main entrance were placed a selection of beautiful articles of ladies' dresses manufactured from the feathers of seabirds by Liardet of Wellington. Over these on one side were suspended the plates from Dr. Buller's great work on the ornithology of New Zealand, and on the other groups of photographs of Maoris, all mounted in inlaid frames, which showed to great advantage.

The first upright cases and the table cases in front were occupied by a most interesting collection of Maori mats made of feathers and flax, and by implements of stone, bone, and wood, forming a very instructive ethnological series, part of which was lent by the Smithsonian Institute, from collections brought by the Wilkes' expedition in 1839, and the Transit of Venus expedition of 1874. Maori mats and implements.

On the left hand followed a long glass case containing a classified series of the minerals and ores found in the colony, over which were hung geological maps and sections. Mineralogical specimens.

The next case was filled with an exhibit of 31 kinds of tweed cloth made by Messrs. Webbley of Nelson, in front of which was placed a series of the works published in the colony, handsomely bound. Tweeds.

The remainder of the west side of the court was devoted to phormium fibre in all its forms of preparation and manufacture, from delicate textile fabrics to large hawsers, the coils of which were piled up in several great pillars. Phormium fibre.

On the opposite side of the court was a range of glass cases, 30 feet long, containing selected fleeces of wool, the bulk of which, and also the grain, was shown separately in the Agricultural Hall. Wools.

Nailed up to the wall over part of the wool cases were an extensive exhibit of leather by T. Wilson of Canterbury, and in a good light Mundy's celebrated series of photographic landscapes, and Sealey's views of the Southern Alps were grouped round Dr. Von Haast's elaborate map of the glaciers and mountain system of Canterbury. Leather.

H. Severn's panoramic views of the Thames goldfield were also against the wall, while in various vacant places other maps and views and 50 sheets of Auckland ferns, and 12 exquisite views of the Rotomahana geysers, by McCombie of Auckland, were suspended. Panoramic photography.

The total number of views exhibited in the court was 549, all of which had been specially mounted in walnut by Mr. Creamer of Philadelphia.

Over the centre line of the court were suspended two large maps of the colony, by Dr. Hector, the one geological and the other physical, contrasting the present surface features with those of later tertiary times. Maps, geological and physical.

The area of the New Zealand Court was 1,600 sq. feet, and the number of exhibits entered was 1,114. Area.

#### THE FOLLOWING AWARDS WERE ALLOTTED TO NEW ZEALAND BY THE INTERNATIONAL JUDGES.

*P signifies Award for Exhibit.*

(The Government of New Zealand received award for Collective Exhibit.)

Typographic Maps and Entomological Collection.

Geological Maps and Charts.

Aboriginal Weapons and Clothing.

*P* The Centennial Commission for New Zealand.—Phormium tenax.

*P* Dr. James Hector, New Zealand Commissioner, and Director of Colonial Museum:—

*P* Kauri Gum.

*P* Barks for Tanning.

*P* Vegetable Fibres.

*P* Geological Maps and Reports.

- P The Colonial Museum.—Collection of Minerals.  
 P The New Zealand Institute.—Vols. I. to VII., Transactions and Proceedings.  
 P W. S. Peter, Canterbury.—Merino Wool.  
 P Samuel Bealey, Canterbury.— Do.  
 P John Hall, Canterbury.— Do.  
 P G. A. Anstey, Nelson.— Do.  
 P J. Cathcart Wason, Canterbury.—Merino and Lincoln Wool.  
 P A. Branthwaite, Wellington.—Wool.  
 P J. M. Rickman, Canterbury.— Do.  
 P Charles Chinnery, Addington, Canterbury.—Phormium Fibre.  
 P W. D. Wood, Christchurch, Canterbury.—Wheat.  
 P P. S. Cunningham & Co., Christchurch, Canterbury.—Wheat.  
 P E. H. Banks, Christchurch, Canterbury.—Cereals.  
 P Robert Wilkins, Christchurch, Canterbury.—Grass Seed.  
 P Henderson and Farran, Wellington.—Ale and Stout.  
 P James Smith.—Fruit Wines.  
 P Hector E. Liardet, Wellington.—Muffs and Collarets of Feather Furs—Albatross and other sea birds.  
 P R. Walker & Co., Auckland.—Kauri Gum.  
 P W. S. Prayling.—Wood Extract.  
 P John Chambers.—Pressed Ferns.

## Catalogue.

 , OFFICIAL CATALOGUE OF NEW ZEALAND EXHIBITS IN THE  
 PHILADELPHIA EXHIBITION, 1876.

DEP. I.—MINING AND METALLURGY.

DEP. II.—MANUFACTURES.

DEP. VI.—AGRICULTURE.

DEP. VII.—HORTICULTURE.

*North of Nave, Columns 10 to 17.*

## Nelson.

## DEP. I.—MINERALS, ORES, STONE, MINING PRODUCTS.

 1. *Parapara Iron and Coal Company, Nelson.*

- |            |          |   |
|------------|----------|---|
| Iron ore.  | Cl. 100. | a. Brown hematite ore.                        |
| Coal.      | Cl. 101. | b. Coal from the Arore river.                 |
| Limestone. | Cl. 103. | c. Limestone used as a flux for hematite ore. |

 2. *Johnstone Brothers, Nelson.*

- |       |          |                    |
|-------|----------|--------------------|
| Iron. | Cl. 100. | Hematite iron ore. |
|-------|----------|--------------------|

 3. *Nelson Committee, Nelson.*

- |                  |          |   |
|------------------|----------|---|
| Sundry ores.     | Cl. 100. | a. Iron, plumbago, galena zinc, blend copper, antimony, and argentiferous lead ores.    |
| Coal.            | Cl. 101. | b. Coal from Coalbrookdale, Mount Rochfort, and Reefton.                                |
| Marble.          | Cl. 102. | c. Marble from Ruatanuka, Golden Bay.   |
| Porcelain clays. | Cl. 104. | d. Porcelain clays from Pakawar and Ruatanuka, steatite from Golden Gully, Collingwood. |

 4. *Louisson, T. B., Nelson.*

- |           |          |                              |
|-----------|----------|------------------------------|
| Iron ore. | Cl. 100. | Iron ore, calcined iron ore. |
|-----------|----------|------------------------------|

 5. *Washbourn, W. E., Nelson.*

- |           |          |                         |
|-----------|----------|-------------------------|
| Lead ore. | Cl. 100. | Argentiferous lead ore. |
|-----------|----------|-------------------------|

 6. *Taranaki Committee.*

- |                                |          |   |
|--------------------------------|----------|---|
| Taranaki Committee collection. | Cl. 100. | a. Titanic iron sand, older tertiary marl, trachyte pebble, trachyte with crystals of hornblende, obsidian, nephrite taranakite, carnelian. |
|                                | Cl. 101. | b. Lignite from Urenni.   |
|                                | Cl. 101. | c. Potter's clay from Urenni.   |

7. *Colonial Museum, Wellington. (James Hector, Director.)*

- Cl. 100. a. Collection of minerals, containing magnetic iron, hematite, chrome, copper, lead, zinc, and manganese ores. Colonial Museum, Wellington.  
 Cl. 101. b. Specimens illustrating the classification of New Zealand coals, petroleum from Sugar-loaf Point, Waiapu, Waipawa.  
 Cl. 102. c. Marble from Collingwood, Nelson.  
 Cl. 104. d. Steatite from Parapara Volley, Nelson.

8. *Kennedy Brothers, Nelson.*

- Cl. 101. a. Coal from the Brenner mine, and coke manufactured from it. Coal and fire-clay.  
 Cl. 104. b. Raw and ground fire-clay.

9. *Albion Coal Company, Nelson.*

- Cl. 101. Coal from Negakanaw. Coal.

10. *Reid, Alexander W., Canterbury.*

- Cl. 101. Coal from Kowai Pass. Coal.

11. *Oakden, J. J., Canterbury.*

- Cl. 101. Anthracite coal from Lake Coleridge. Anthracite.

12. *Rowley, Wilson, & Co., Otago.*

- Cl. 101. Coal from Shag Point, Palmerston. Coal.

13. *Ross, A., Poverty Bay, Auckland.*

- Cl. 101. Petroleum. Petroleum.

14. *Wilson, W., Christchurch.*

- Cl. 102. Hewn white and yellow limestone. Limestone.

## METALLURGICAL PRODUCTS.

15. *New Zealand Commissioners.*

- Cl. 110. Specimens of alluvial gold, and gold bearing quartz from Auckland, Westland, and Otago, collected by the Bank of New Zealand. Gold and silver in quartz and bars.

16. *Government of New Zealand.*

- Cl. 110. Specimens of alluvial gold from Nelson and Westland, and of auriferous quartz from the West coast, specimens of alluvial gold from Otago, bars of melted and refined gold, bars of chloride of silver, and silver, model representing gold exported from New Zealand, 1872-75.

17. *Nelson Committee.*

- Cl. 110. Specimens of auriferous quartz from Reefton.

18. *Reefton Committee.*

- Cl. 110. Specimens of auriferous quartz from the Inaugahua and Lyell districts, Nelson.

19. *Tolhurst, George E., Bank of New Zealand.*

- Cl. 110. Models of gold ingots.

## DEP. II.—CHEMICALS.

1. *Horter, John, Woolston, Canterbury.*

- Cl. 201. Soap and mould candles.

2. *Innes, W. M., Port Chalmers, Otago.*

- Cl. 201. Cod liver oil.

3. *Louisson, T. B., Nelson.*

- Cl. 202. Paint made from hematite ore.

4. *Johnston Brothers, Nelson.*

- Cl. 202. Umber and red pigments made from hematite ore.

4A. *Felton & Co.*

- Cl. 202. Varnish made from Kauri gum.

Candles, oils, minerals, paints, varnishes, and pharmaceuticals.

5. *Grayling, W. S., Taranaki.*Cl. 202. Extract of tawai (*Weinmannia racemosa*).Cl. 202. Extract of hinaw (*Eleocarpus dentatus*).

Ceramics, &amp;c.

## CERAMICS.—POTTERY, PORCELAIN, GLASS, &amp;c.

6. *Kennedy Brothers, Nelson.*

Cl. 207. Fire bricks, furniture, and objects of general use in construction and in dwellings.

7. *Greenfield and Stewart, Wellington.*Cl. 227. Panel door made of rimu (*Dacrydium cupressinum*).

Yarns and woven goods of vegetable and mineral materials.

## YARNS AND WOVEN GOODS OF VEGETABLE AND MINERAL MATERIALS.

8. *Government of New Zealand.*

Cl. 233. Specimens of fabrics made from Phormium tenax.

Of wool.

## WOVEN AND FELTED GOODS OF WOOL, &amp;c.

9. *Webley Brothers, Nelson.*

Cl. 233. Nelson tweeds made from New Zealand wool.

10. *Cook, James, Nelson.*

Cl. 239. Woollen rugs, woven and dyed at Nelson.

Clothing, jewellery, &amp;c.

## CLOTHING, JEWELLERY, AND ORNAMENTS, TRAVELLING EQUIPMENTS.

11. *Taylor, B. K., Wanganui.*Cl. 251. Hat made of Kiekie (*Cordyline*).12. *Liardet, H. E., Wellington.*Cl. 254. *a.* Fancy articles made from feet and bones of sea birds.Cl. 256. *b.* Feathers, muffs, collarets, wristlets, &c.13. *Taylor, Mrs. Richard, Wanganui.*

Cl. 254. Ornamental satchel and table mat.

15. *New Zealand Commissioners.*

Cl. 257. Garments and ornaments of the Maoris.

Fabrics of vegetable, animal, or mineral materials.

## FABRICS OF VEGETABLE, ANIMAL, OR MINERAL MATERIALS.

16. *Moyle, Edward, Taranaki.*

Cl. 287. Cord made from phormium tenax.

17. *Bevan, Thomas, jun., Otaki, Wellington.*

Cl. 287. Rope made from Maori dressed phormium, fish line, horse halter lead line twine.

18. *Bevan and Sons, Otaki, Wellington.*

Cl. 287. Cord and twine made from Maori dressed phormium.

19. *Kinross & Co., Hawke Bay.*

Cl. 287. Cordage and twines made from Maori dressed phormium.

20. *Grant & Co., Otago.*

Cl. 287. Cordage made from phormium.

21. *Auckland Patent Steam Rope Company.*

Cl. 287. Phormium rope.

22. *Canterbury Flax Association, Christchurch.*

Cl. 287. Tarred and untarred cordage made from phormium.

23. *Lennon, T., Christchurch.*

- Cl. 287. Cordage, ropes, and twines, made from phormium.

24. *Cook, James, Nelson.*

- Cl. 287. Mats and matting made from phormium.

25. *Simons and Malcolm, Nelson.*

- Cl. 287. Door mats made from phormium.

26. *Colonial Museum. (J. Hector, Director.)*

- Cl. 287. 10 Maori mats.

26A. *Tarahora.*

- Cl. 237. 1 fancy mat, Maori manufacture.

26B. *Chinnery, Charles, Addington, Canterbury.*

- Cl. 287. 1 bale, machine dressed, washed, &c.

26C. *Taranaki Committee.*

- Cl. 287. 1 bale machine dressed.

26D. *Cook, James, Nelson.*

- Cl. 287. Mats and matting.

26E. *Taylor, Mrs. Richard, Wanganui, Wellington.*

- Cl. 287. Ornamented satchel and table mat.

#### INSTITUTIONS AND ORGANIZATIONS.

Institutions and  
organizations.

26F. *Colonial Museum. (J. Hector, Director.)*

- Cl. 312. Garments and ornaments of the Maoris.

27. *National Museum at Washington. (J. Henry, Secretary.)*

- Cl. 312. Garments of the Maoris.

27A. *New Zealand Commissioners.*

- Cl. 312. Weapons of the Maoris.

#### ENGINEERING, ARCHITECTURE, MAPS, &c.

Engineering,  
architecture, &c.

28. *Government of New Zealand.*

- Cl. 335. Geological maps of New Zealand, by J. Hector.

29. *Geological Survey Department. (J. Hector, Director.)*

- Cl. 335. Geological plans and sections.

30. *Canterbury Museum. (J. Von Haast, Director.)*

- Cl. 335. Geological plans and sections.

31A. *Hector, J.*

- Cl. 335. Relief Model of New Zealand, geologically coloured.

32B. *Government of New Zealand.*

- Cl. 335. Topographical maps of the colony, engraved by E. Ravenstein.

#### PHYSICAL, SOCIAL, AND MORAL CONDITION OF MAN.

Physical, social,  
and moral con-  
dition of man.

33. *National Museum, Washington. (J. Henry, Secretary.)*

- Cl. 340. Canoe paddles of Maoris; skulls of Maoris and Moriori from the Chatham islands.

34. *Woon, R. W., Wanganui.*

- Cl. 340. Canoe paddles of the Maoris.

35. *Government of New Zealand.*

- Cl. 345. Statistics and census of New Zealand for 1874, prepared by W. R. E. Brown, Registrar-General.

35A. *Hector, J.*

- Cl. 345. Translations and proceedings of the New Zealand Institute, Vols. I. to VII.

35B. *Vogel, Sir Julius.*

- Cl. 345. Handbook of New Zealand.

Water colours.

## PAINTING.

35c. *Geological Survey Department. (James Hector, Director.)*

Cl. 411. Water colour sketches by W. M. Cooper.

Engraving and lithography.

## ENGRAVING AND LITHOGRAPHY.

35d. *New Zealand Commissioners.*

Cl. 422. Pictures from W. L. Buller's "Birds of New Zealand," drawn by J. H. Kenlemans.

Photography.

## PHOTOGRAPHY.

36. *Burton Brothers, Dunedin.*

Cl. 430. Views of scenery of South Island.

36A. *Bothamley, A. T.*

Cl. 430. Photographs of Maoris.

37. *Government of New Zealand.*

Cl. 430. Views of scenery, &amp;c., by H. Deveril.

38. *Taranaki Committee.*

Cl. 430. Views of New Plymouth and surrounding country.

38A. *Hector, J.*

Cl. 430. Photographs exhibiting domestic life of the Maoris.

39. *Mundy, D. L.*

Cl. 430. Views of scenery, buildings, gold mining, &amp;c.

Railway plant, &amp;c.

## RAILWAY PLANT, ROLLING STOCK, &amp;c.

40. *Government of New Zealand.*

Cl. 570. Photographs of engines and engineering works used in New Zealand.

Arboriculture and forest products.

## ARBORICULTURE AND FOREST PRODUCTS.

41. *Cruickshank, J. D., Upper Hutt Sawing Mills, Wellington.*Cl. 600. Section of trunk of rimu (*dacrydium cupressinum*), red pine of settlers.42. *Westland Committee.*

Specimens of woods with barks.

43. *Taranaki Committee.*

Cl. 601. a. Specimens of woods.

Cl. 602. b. Barks of the Atawhero and the Pakatea, earth used by the Maoris as a mordant for dyes.

Cl. 602. c. Dried ferns; fungus exported as food to China, esculent fern root, bird's nest fungus and curious parasite.

44. *Black, W. B., American Coach Factory, Wellington.*

Cl. 601. Specimens of woods.

45. *New Zealand Commissioners.*

Cl. 601. Specimens of woods.

46. *Grayling, W. S., Taranaki.*

Cl. 602. Bark of Hinau; blue earth used by the Maoris mixed with shark oil as blue paint.

47. *Colonial Museum, Wellington. (James Hector, Director.)*

Cl. 602. Tan barks native to New Zealand.

49. *Walker, Renwicks, & Co., New York.*

Cl. 603. Kauri gum.

50. *Forbes, R. W., New York.*

Cl. 603. Kauri gum.

## AGRICULTURAL PRODUCTS.

51. *Banks, E. H., Christchurch.*

Cl. 620. Oats and other cereals.

52. *Wood, W. D., Christchurch.*

Cl. 620. Wheat.

Agricultural products.

53. *Cunningham, P., & Co., Christchurch.*  
 Cl. 620. Wheat grown in Canterbury.  
 54. *Ruddenklaw, J. G., Addington, Canterbury.*  
 Cl. 620. Wheat.  
 55. *Hooper and Dodson, Nelson.*  
 Cl. 623. Hops.  
 56. *Wilkin, Robert, Christchurch.*  
 Cl. 624. Perennial rye grass and cocks foot seed.  
 57. *Armstrong, J. B., Christchurch.*  
 Cl. 624. Phormium seeds.

## ANIMAL AND VEGETABLE PRODUCTS.

Animal and vegetable products.

58. *Wilson, Thomas, Woolston, Canterbury.*  
 Cl. 652. Saddle, harness, and shoemaker's leather, fancy coloured skins for shoemakers and bookbinders.  
 59. *Armitage, Taranaki.*  
 Cl. 652. Dressed kip and calf leather.  
 60. *Morris, Thomas, Oamaru, Otago.*  
 Cl. 652. Gentleman's town saddle.  
 61. *National Museum, Washington. (J. Henry, Secretary.)*  
 Cl. 652. a. Specimens of Kiwi, skeleton and bones of Moa.  
 Cl. 653. b. Egg of the Kiwi, model of egg of Moa.  
 62. *Gilmour, John, Christchurch.*  
 Cl. 656. Hams and bacon.  
 63. *New Zealand Provision and Produce Company, Christchurch.*  
 Cl. 656. Preserved meats.  
 64. *Nairn, David, Addington, Canterbury.*  
 Cl. 656. Tomato sauce.  
 65. *Trent Brothers, Woolston, Canterbury.*  
 Cl. 657. Chicory in different stages of preparation.  
 66. *Smith, James, Nelson.*  
 Cl. 660. Fruit vines.  
 67. *Henderson and Farrah, Wanganui.*  
 Cl. 660. Ale and Porter.

## HORTICULTURE.

Horticulture.

68. *Coates, Laning, Christchurch.*  
 Cl. 707. Live ferns.

## EAST AISLE, COLUMNS 1 to 5.

## DEP. VI.—AGRICULTURAL PRODUCTS.

Agricultural products.

1. *Banks, E. H., Christchurch.*  
 Cl. 620. Oats and other cereals.  
 2. *Wood, W. D., Christchurch.*  
 Cl. 620. Wheat.  
 3. *Cunningham, P., & Co., Christchurch.*  
 Cl. 620. Wheat grown in Canterbury.  
 4. *Ruddenklaw, J. G., Addington, Canterbury.*  
 Cl. 620. Wheat.  
 5. *Wilkins, Robert, Christchurch.*  
 Cl. 624. Perennial rye grass and cocks foot seed.  
 6. *Peter, W. S., Anama, Ashburton, Canterbury.*  
 Cl. 667. Merino Wool.

Oats, &amp;c.

Wheat.

Wool.

7. *Bealy, Samuel, Canterbury.*

Cl. 667. Merino and Romney Marsh wool.

8. *Rutherford, A. W., Amuri, Nelson.*

Cl. 667. Merino wool.

9. *Anstey, G. H., Amuri, Nelson.*

Cl. 667. Merino wool.

10. *Wason, J. Cathcart, South Rakaia, Canterbury.*

Cl. 667. Wools.

11. *Hall, John, Hororata, Canterbury.*

Cl. 667. Merino wool.

12. *Rickman, F. M., Rangiora, Canterbury.*

Cl. 667. Romney Marsh wool.

13. *Braithwaite, Arthur, Hutt, Wellington.*

Cl. 667. Romney Marsh wool.

## DEP. VII.—ORNAMENTAL TREES AND SHRUBS.

1. *New Zealand Esculent Fern Root.*

Fern roots.

Cl. 707. Root will germinate if crushed and planted in rich soil and shady place. Collection of ferns.

## I.—GENERAL AND GEOGRAPHICAL.

a. *Situation and Area.*

North and South Islands.

The colony of New Zealand consists of two principal islands called the North and South Islands, and a small island at the southern extremity called Stewart Island. There are also several small islets such as the Chatham and Auckland Isles that are dependent on the colony. The entire group lies between 34° and 48° S. lat. and 166° and 179° E. long. The two principal islands with Stewart Island extend in length 1,100 miles, but their breadth is extremely variable, ranging from 46 miles to 250 miles, the average being about 140 miles, but no part is anywhere more distant than 75 miles from the coast.

Total area.  
Separate areas.

	Sq. miles.	Acres.
The total area of New Zealand is about	- 100,000 or 64,000,000	
The total area of the North Island being	- 44,000 „	28,000,000
The total area of the South Island being	- 55,000 „	36,000,000
The total area of Stewart's Island being	- 1,000 „	640,000

It will thus be seen that the total area of New Zealand is somewhat less than Great Britain and Ireland. The North and South Islands are separated by a strait only thirteen miles across at the narrowest part; presenting a feature of the greatest importance to the colony from its facilitating inter-colonial communication between the different provinces without the necessity of sailing right round the colony.

North Island provinces.

The North Island was up to this year divided into four provinces, viz., Auckland, Taranaki, Hawke's Bay, and Wellington; Taranaki and Hawke's Bay lie on the west and east coasts respectively, between the two more important provinces of Auckland on the north, and Wellington on the south.

South Island provinces.

The South Island was divided into five provinces, viz., Nelson, Marlborough, Canterbury, Otago, and Westland (Southland was for a short time an independent province); Nelson and Marlborough are in the north, Canterbury in the centre, Otago in the south, and Westland to the west of Canterbury.

Sub-division into counties in 1877.

These provinces will, however, in 1877 be abolished and divided into counties, and Provincial Government will cease to exist.

The following are the names of these counties:—

Names of counties.

*In the North Island.*—Mongonui, Hokianga, Bay of Islands, Whangarei, Hobson, Rodney, Waitemata, Eden, Manukau, Coromandel, Thames, Piako,

Waikato, Waipa, Raglan, Kawhia, Taranaki, Patea, Tauranga, Whakatam, Cook, Wairoa, Hawke's Bay, Wanganui, West Taupo, East Taupo, Rangitikei, Manawatu, Waipawa, Hutt, Wairarapa West, Wairarapa East, counties.

*In the South Island.*—Sounds, Marlborough, Kaikoura, Waimea, Collingwood, Buller, Inangalma, Amuri, Cheviot, Grey, Ashley, Selwyn, Akaroa, Ashburton, Geraldine, Waimati, Westland, Waitaki, Waikouaiti, Maniototo, Vincent, Lake, Peninsula, Taieri, Bruce, Clutha, Tuapeka, Southland, Wallace, Fiord counties, and Stewart Island county.

New Zealand is very mountainous with extensive plains lying principally on the eastern side of the mountain range in the South Island, while in the North Island they lie on the western side, the interior or more mountainous parts being covered with dense forest, while those of the South Island are open for the greater part and well grassed and used for pastoral purposes. Mountains and plains.

In the North Island the mountains occupy one tenth of the surface, and do not exceed 1,500 feet in height with the exception of a few volcanic mountains that are very lofty, one of which Tongariro (6,500 feet) is still occasionally active, Ruapehu (9,100 feet) and Mount Egmont (8,300 feet) are extinct volcanoes that reach above the limit of perpetual snow, the latter is surrounded by one of the most extensive and fertile districts in New Zealand.

The range in the South Island, known as the Southern Alps, is crossed at intervals by low passes; the greatest height of the main range is 10,000 feet to 14,000 feet and it has extensive snow fields and glaciers.

#### b. History.

New Zealand appears to have been first discovered and first peopled by the Maori race, a remnant of which still inhabits parts of the islands. At what time the discovery was made, or from what place the discoverers came, are matters which are lost in the obscurity which envelopes the history of a people without letters. Little more can now be gathered from their traditions than that they were immigrants, not indigenous; and that when they came there were probably no other inhabitants of the country. Similarity of language indicates a northern origin, probably Malay, and proves that they advanced to New Zealand through various groups of the Pacific islands in which they left deposits of the same race, who to this day speak the same or nearly the same tongue. When Cook first visited New Zealand he availed himself of the assistance of a native from Tahiti, whose language proved to be almost identical with that of the New Zealanders, and through the medium of whose interpretation a large amount of information respecting the country and its inhabitants was obtained which could not have been had without it. First settlement by Maoris.

The first European who made the existence of New Zealand known to the civilized world, and who gave it the name it bears, was Tasman, the Dutch navigator, who visited it in 1642. Claims to earlier discovery by other European explorers have been raised, but they are unsupported by any sufficient evidence. Tasman did not land on any part of the islands, but having had a boat's crew cut off by the natives in the bay now known as Massacre Bay, he contented himself by sailing along the western coast of the north island, and quitted its shores without taking possession of the country in the name of the government he served; a formality which, according to the law of nations (which regards the occupation by savages as a thing of small account), would have entitled the Dutch to call New Zealand theirs—at least so far as to exclude other civilized nations from colonizing it, and conferring on themselves the right to do so. From the date of Tasman's flying visit to 1769, no stranger is known to have visited the islands. In the latter year Captain Cook reached them in the course of the first of those voyages of great enterprise which have made his name illustrious. Discovery by Tasman in 1642.

The first of Cook's voyages of discovery began in August 1768, when he was sent to Tahiti to observe the transit of Venus; after a run of 86 days from Tahiti, having touched at some other places, he sighted the coast of New Zealand on 6th October 1769. On the 8th he landed in Poverty Bay, on the east coast of the North Island. Visited by Captain Cook in 1769.

### c. *The Native Race.*

Origin of the  
Maori race.

There is not any record as to the origin of the Maori race. Its arrival in New Zealand, according to tradition, is due to an event which, from its physical possibility, and from the concurrent testimony of the various tribes, is probably true in its main facts.

Traditional  
history.

The tradition runs, that generations ago a large migration took place from an island in the Pacific Ocean, to which the Maoris gives the name of Hawaiiiki, quarrels among the natives having driven from it a chief, whose canoe arrived upon the shore of the North Island of New Zealand. Returning to his home with a flattering description of the country he had discovered, this chief, it is said, set on foot a scheme of emigration, and a fleet of large double canoes started for the new land. The names of most of the canoes are still remembered, and each tribe agrees in its account of the doings of the principal "canoes," that is, of the people who came in them after their arrival in New Zealand, and from which the descent of the numerous tribes are specified. Calculations, based on the genealogical sticks kept by the *tohungas* or priests, have been made, that about 20 generations have passed since this migration, which would indicate the date to be about the beginning of the 15th century. The position of Hawaiiiki is not known, but there are several islands of a somewhat similar name.

Native popula-  
tion. Northern  
Island.

The Northern Island now contains a native population of about 45,000, divided into many tribes, and scattered over 45,156 square miles.

The most important tribe is that of Ngapuhi, which inhabit the northern portion of the North Island, in the province of Auckland. It was among the Ngapuhi that the seeds of Christianity and of civilization were first sown, and among them are found the best evidences of the progress which the Maori can make.

Forty years ago.

Forty years ago the only town in New Zealand, Kororareka, Bay of Islands, existed within their territories. Their chiefs, assembled in February 1840, near the "Waitangi" or "Weeping Water" Falls, were the first to sign the treaty by which the Maoris acknowledged themselves to be subjects of Her Majesty; and although under the leadership of an ambitious chief, Hone Heke, a portion of them in 1845 disputed the English supremacy, yet when subdued by English troops and native allies (their own kinsmen) they adhered implicitly to the pledges they gave, and since then not a shadow of doubt has been cast on the fidelity of the "Loyal Ngapuhi."

South Island,  
native popula-  
tion.

The South Island natives number but 3,000, and they are spread over an immense tract of country, living in groups of a few families on the reserves made for them, when the lands were purchased—for the whole of the South Island has been bought from the native owners by the Government. Whatever may be the cause, it is a fact that the natives of the South Island are apathetic and careless, as compared with their brethren in the north.

As a rule the Maoris are middle sized and well formed, the average height of the men being 5 ft. 6 in.; the bodies and arms being longer than those of the average Englishman, but the leg bones being shorter, and the calves largely developed. In bodily powers the Englishman has the advantage. As a carrier of heavy burdens, the native is the superior, but in exercises of strength and endurance, the average Englishman surpasses the average Maori.

### d. *Vegetation.*

Vegetable  
products.

The indigenous forest of New Zealand is evergreen, and contains a large variety of valuable woods (*see* section on this subject). Amongst the smaller plants the *phormium tenax*, or New Zealand flax, is of especial value, whilst large tracts of country are covered with indigenous grasses of high feeding quality, which support millions of sheep, and have thus been productive of great wealth to the colony. Many of the more valuable trees of Europe, America, and Australia have been introduced and have flourished with a vigour scarcely ever attained in their natural habitats. In many parts of the colony the hop grows with unexampled luxuriance; whilst all the European grasses and other useful plants produce returns equal to those of the most favoured localities at home. Fruit too is abundant all over New Zealand. Even as low as the latitude of Wellington, oranges, lemons, citrons,

and loquats are found, whilst peaches, pears, grapes, apricots, figs, melons, and, indeed, all the ordinary fruits of temperate climates abound. Root and vegetables of all kinds grow abundantly.

#### *e. Agriculture.*

Allusion has been made to the area of country occupied by mountain ranges in New Zealand, and the general position they occupy with reference to the geography of the country; and it may be further stated that, with the exception of the alpine ranges, every part of the country is more or less adapted for settlement of some kind. A clearer idea of the value of the country, and the purposes to which it is applicable is, however, obtained by a comparison of the rock formations, the decomposition of which produces the soils, as shown in the following table, from a study of which it will be found that in the whole of the colony there are about 12,000,000 acres of land fitted for agriculture, wherein the form of surface is suitable, and about 50,000,000 which are better adapted for pasturage; but from these estimates allowance must be made for about 20,000,000 acres of surface at present covered by forest.

The following table gives a classification of the lands according to the geological subsoil:—

Classification of geological subsoil.

	North Island.	South Island.	Totals.
1. Fluvialite drifts, one-third agricultural - - -	8,447	6,286	14,733
2. Marine tertiary, two-thirds agricultural (rest pastoral) - -	13,898	4,201	18,099
3. Upper secondary, coal bearing, pastoral - - -	2,390	2,110	4,500
4. Palaeozoic, pastoral - - -	5,437	20,231	25,668
5. Schistose, pastoral - - -	—	15,308	15,308
6. Granite, worthless - - -	—	5,978	5,978
7. Volcanic, one-sixth agricultural (rest pastoral) - - -	14,564	1,150	15,714
Square miles - - -	44,736	55,264	100,000

It would be beyond the scope of this description to give in detail the endless varieties of soil which are found in New Zealand, but attention may be drawn to the chief peculiarities. In the north of Auckland, including the lower portion of the Waikato valley, light volcanic soils prevail, interspersed with areas of clay marl, which in the natural state, is cold and uninviting to the agriculturist, but which may, nevertheless, under proper drainage and cultivation, be brought to a high state of productiveness. The latter are, however, almost universally neglected at the present time by the settlers, who prefer the more easily worked and more rapidly remunerative soils derived from the volcanic rocks.

In the western district, which extends round to Taranaki and Wanganui, the soil is all that can be desired, and is probably one of the richest areas in the southern hemisphere. The surface soil is formed by the decomposition of calcareous marls, which underlie the whole country, intermixed with the débris from the lava-streams and tufaceous rocks of the extinct volcanic mountains. The noble character of the forest growth which generally covers the area, proves the productiveness of its soil, although at the same time it greatly impedes the progress of settlement.

In the central district of the North Island, from Taupo towards the Bay of Plenty, the surface soil is derived from rocks of a highly siliceous character, and large areas are covered with little else than loose friable pumice-stone. Towards the coast and in some limited areas near the larger valleys, such as the Waikato and the Thames, and also when volcanic rocks of a less arid description appear at the surface, great fertility prevails, and any

deficiencies in the character of the soil are amply compensated for by the magnificence of the climate of this part of New Zealand. On the eastern side of the slate range, which extends through the north island, the surface of the country is generally formed of clay marl and calcareous rocks, the valleys being occupied by shingle deposits derived from the slate and sandstone rocks of the back ranges, with occasional areas of fertile alluvium of considerable extent. It is only the latter portions of this district which can be considered as adapted for agriculture, while the remainder affords some of the finest pastoral land to be met with in any part of the colony.

Southern district.

In the south district the chief agricultural areas are in the vicinity of the sea coast, but there are also small areas in the interior, in the vicinity of the lake districts, where agriculture can be profitably followed. The alluvial soil of the lower part of the Canterbury plains and of Southland are the most remarkable for their fertility; but scarcely less important are the low rolling downs formed by the calcareous rocks of the tertiary formation, which skirt the higher mountain masses, and frequently have their quality improved by the disintegration of interspersed basaltic rocks.

Western side.

On the western side of the island the rapid fall of the rivers carries the material derived from the mountain ranges almost to the sea coast, so that comparatively small areas are occupied by good alluvial soil; but these, favoured by the humidity of the climate, possess a remarkable degree of fertility.

By the proper selection of soil, and with a system of agriculture modified to suit the great variety of climate which necessarily prevails in a country extending over 12 degrees of temperate latitude, every variety of cereal and root crop may be successfully raised in New Zealand; and with due care in these respects, New Zealand will not fail to become a great producing and exporting country of all the chief food staples.

#### *f. Animal Life.*

Animals.

Until the systematic colonization of the island New Zealand was very destitute of terrestrial or animal life suitable to the wants of civilized man, the only animals being a small rat, a dog (which had probably been introduced since the islands were peopled by the present race), and pigs, the produce of some animals left by Captain Cook and the navigators that succeeded him; through the agency of the early missionaries and by whale ships, many useful animals and plants were then introduced. In more recent years all kinds of domestic animals, many of very high quality, have been imported, including valuable breeds of sheep and the American llama. Domestic poultry of almost every species has also been introduced and, through the agency of the Acclimatization Societies, many species of game (such as hares, pheasants, partridges, black game, red grouse, quail, &c.) and a host of the smaller birds of Europe and other countries have been spread throughout the islands. The rivers too of New Zealand, which formerly produced only the eel and a few small salmonoid fish of little value, are gradually being stocked with trout, whilst perch, tench, and carp have also been satisfactorily acclimatized.

#### *g. Whaling.*

Whaling.

New Zealand is the chief centre of the Southern Whale Fisheries, and at certain seasons the less frequented harbours are visited by whalers for the purpose of refitting and carrying on shore fishing and barrelling their oil. These are generally American ships, but Otago and Auckland whaling ships are also equipped by New Zealand owners. The sperm whale abounds in the region of the ocean lying to the N.E. of New Zealand, but stragglers are found all round the coast. In the open sea and to the south the most prized whale next to the sperm is the black whale or tohoru (*Eubalenus Australis*) which is like the right whale of the North Sea, but with baleen of less value. Along the shore the chief whales captured are the Humpback (*Megaptera*) and Rorquals (*Sibaldius*), which become very abundant when not disturbed for a few years.

Value of whale oil.

In 1875, 20,845 gallons of black whale oil were exported, valued at 4,100*l.* and 7,775 gallons of sperm, valued at 2,894*l.*

Fur seal.

The sea bear or fur seal (*Arctocephalus cinerius*) is found in the remote parts of the coasts, a thousand skins being taken every year by boating parties.

Value of seal skins.

In 1875 there were exported 2,767 seal skins, valued at 4,050*l.*

### *h. Fisheries.*

The fisheries promise to become an important industry. About 180 species of fish have been found in the New Zealand seas, and in the rivers; and of this number about 40 are commonly used as food. The supply is abundant on some parts of the coasts, and the quality of the fish on the whole is better than in most other countries. The deep sea fish are not yet well known, as the fishermen rarely leave the harbours and the immediate vicinity of the island. Several companies have been formed for developing the deep sea fisheries, but they soon break down, as there is not yet in the colony a sufficiently concentrated population to consume the enormous supply of fresh fish they bring to market. Fish-curing establishments, however, thrive well, especially in the south, where species allied to the haddock are found abundantly.

The chief species of fish used as food on all parts of the coast are the hapuka (*Oligarus gigas*) a sea perch that grows to 130 lbs. weight. The tarakihi (*Cheilo-dactylus macropterus*), moki (*Latris ciliaris*), both sea breams, the ana (*Dajus lorsteri*) sea mullet, the patiki, by which name are known several delicious kinds of flounders, soles, and other flat fish. In the north we have as peculiar species the grey mullet (*Mugil perusii*), the snapper or sea braize (*Payrus unicolor*), the trevally or yellow tail (*Caranx georgianus*), the hautur or horse mackerel (*Trachurus trachurus*), and in the south the kohikohi or trumpeter (*Latris hectea*), the most highly prized fish in the colony, and generally sold at 2s. 6d. per lb., the marere or butter fish (*Coridodax pullus*) and the red cod (*Lotetta bacchus*) from which admirable smoked fish like the famous Findon haddock of Aberdeen are prepared.

Besides the above are many occasional and seasonal visitors to the coast, the chief being the king fish (*Seriola lalandii*), the true mackerel (*Scombar Australasicus*), the frost fish (*Lipidopus candatus*), the warehon (*Neptonemus brama*), the John Dory (*Teus faber*), the barracouta (*Thyrstites atun*), the pilchard (*Clupea sagax*), and many others.

On the whole the fish found on the New Zealand coasts resemble those on the coast of Spain in the Bay of Biscay. The rivers and lakes are full of large and excellent eels, and a few species of indigenous salmonoids like the grayling (*Prototrectes oxyhynchus*), and smelt (*Retropinna richardsoni*), but of late years the brown and speckled trout and the sea trout have been successfully established in many of the streams. Salmon, both from Scotland and the Pacific coast of North America, have also been named for imported ova; and it is anticipated, that in a few years they will be equally well established.

There is a singular absence of crabs and lobsters, the only edible crustacea in New Zealand being the sea and fresh water crayfish or roura, the latter being of enormous size. Shell fish of all kinds are very abundant, and form the staple food of the native population on the coast.

## II.—FORM OF GOVERNMENT.

The colony has up to 1876 been divided into nine provinces, each of which has had an elective Superintendent, and a Provincial Council, also elective. In each case the election was for four years, but a dissolution of the Provincial Council by the Governor could take place at any time, necessitating a fresh election, both of the Council and of the Superintendent. The Superintendent was chosen by the electors of the old province; the members of the Provincial Council by those of electoral districts.

The Provincial form of government has this year (1876) been abolished, and the country divided into counties and road boards, to which, and to the municipalities, local administration formerly executed by the Provincial Government is confided. The full extension of this important change in the form of government does not come into operation until January 1877.

Executive power is nominally vested in a Governor appointed by the Queen, but he is bound to act, as is Her Majesty herself, in conformity with the principles of responsible Government, which for practical purposes vests the direction of affairs in the representatives of the people. In cases of direct Imperial interest the Governor would no doubt act under orders of the Imperial Government. Legislative power is vested in the Governor and two chambers, one called the Legislative Council, consisting at present of forty-nine members

180 species of fish.

Deep sea fishery neglected.

Varieties.

Occasional visitors.

Resemblance of fish to those in Bay of Biscay.

Crustacean.

Division into provinces up to 1876.

Present subdivision into counties.

Form of Government.

Electoral franchise.	nominated by the Governor for life, and the other the House of Representatives, elected by the people from time to time for five years, and now consisting of seventy-eight members.
Qualifications for membership of the House of Representatives.	Any man of 21 years and upwards, who is a born or naturalized British subject, and who has held for six months a freehold of the clear value of £50, or who has a leasehold with three years to run, or of which he has been in possession for three years, or who is a householder having occupied for six months a house in town of the yearly value of £10, or if not in a town, then of the yearly value of £5, can by registration qualify himself to vote for the election of a member of the House of Representatives. Every man who has for six months held a miners right on a gold field is entitled to vote in a district partly or wholly situated within the limits of the gold fields, provided that no such person is otherwise qualified to vote within such district. Any person qualified to vote for the election of a member of the House of Representatives is also, generally speaking, qualified to be himself elected a member of that House.
Disqualifications.	There are, however, certain special disqualifications for membership, such as grave crime, bankruptcy, and paid office (other than what is called political) in the colonial service. Four of the members of the House are natives, elected under a special law by natives alone.
Powers of Colonial Legislature.	The Colonial Legislature, which meets once a year, has power generally to make laws for the peace, order, and good government of New Zealand. The Acts passed by it are subject to the disallowance, and in a very few cases are required to be reserved for the signification of the pleasure of Her Majesty, but there have not been, in the course of the twenty years since the constitution was granted, more than half a dozen instances of disallowance or refusal of assent. The Legislature has also, with a few exceptions, ample power to modify the constitution of the colony. Executive power is administered as before stated in accordance with the usage of responsible government as it exists in the United Kingdom.
Form of Government assimilated to the Imperial.	The Governor represents the Crown, and his ministers must possess the confidence of the majority in the House of Representatives. Except in matters of purely Imperial concern, the Governor as a rule acts on the advice of his ministers. He has power to dismiss them and appoint others, but the ultimate control rests with the representatives of the people, who hold the strings of the public purse.
Crown lands and gold fields vested in Colonial Parliament. Municipal government.	Legislation concerning the sale and disposal of Crown lands, and the occupation of gold fields, is exclusively vested in the Colonial Parliament. There are in most towns in the colony, municipal bodies, such as mayors and town councils in England, invested with ample powers for sanitary and other municipal purposes; and there are in various country districts elective road boards charged with the construction and repair of roads and bridges, and with other local matters. There are also central and local boards of health appointed under a Public Health Act, and having authority to act vigorously, both in towns and in the country, for the prevention and suppression of dangerous infectious diseases.
Meteorological observations.	The above short summary of the system of government in New Zealand suffices to show that the leading characteristics of the British Constitution—self-government and localised self-administration—are preserved and in fact extended in the New Zealand Constitution; that there is ample power to regulate its institutions, and to adapt them from time to time to the growth and progress of the colony, and to its varied requirements; and that it is the privilege of every colonist to take a personal part to some extent, either as elector or elected, in the conduct of public affairs, and in the promotion of the welfare of the community.

### III.—CLIMATE.

#### a. Nature of Observations.

Meteorological observations have been made ever since the founding of the colony, though at first they were of an irregular character, and only with the view of comparing the climate of New Zealand with that of other countries. From 1853 Meteorological Reports appear regularly appended to the Registrar-General's statistics, but it was not until 1859 that systematic observations were

undertaken by a department established by Government. In that year eleven Stations of instruments. stations, equipped with carefully compared instruments, were established at Mongonui, Auckland, Napier, New Plymouth, and Wellington in the North Island; Nelson, Christchurch, Dunedin, and Invercargil, and some years later at Hokitika and Bealey in the South Island.

At a later date several new stations were established, making in all fifteen Total number 15. stations, from which monthly returns are sent to the head office in Wellington. From these the following returns are prepared for publication:—

I. A provisional return obtained by telegraph of the results at the chief towns, and which is appended to the monthly report of vital statistics.

II. An abstract of the results for each month compared in the averages for the same month in previous years is published in the Gazette and circulated in a separate form to all correspondents. These abstracts are intended for the guidance of agriculturists and other persons who require to watch the peculiarities of each station closely. Publication of returns.

III. Tabular abstracts in the same form that has been followed since 1853, are prepared for the annual volume of statistics.

IV. A bi-annual report on the climate, embodying all the most interesting results, is published in 8vo. pamphlet and largely circulated.

In addition to the above, daily telegraphic reports of the weather are obtained at 9 a.m. from 25 stations, and are suspended for public information at all the shipping ports in the colony. Since 1874 this branch has been placed under the charge of a special signal officer, who issues warnings of the probable approach of storms to the different seaports. Daily telegraphic reports from 25 stations.

The following tables embody the averages which have been ascertained for the different elements of the climate of New Zealand.

### b. Temperature.

The climate resembles that of Great Britain, but is more equable, the extremes of daily temperature only varying throughout the year by an average of 20°, whilst London is 7° colder than the North, and 4° colder than the South Island of New Zealand. The mean annual temperature of the North Island is 57°, and of the South Island 52°, that of London and New York being 51°. Climate.

The mean annual temperature of the different seasons for the whole colony is, in spring 55°, in summer 63°, in autumn 57°, and in winter 48°. Mean annual temperature.

## COMPARATIVE TEMPERATURES OF NEW ZEALAND.

### I.—GENERAL ABSTRACT.

—	S. Lat.	Long. E. from Green- wich.	No. of Years of Observation.	Year.	Winter.	Spring.	Summer.	Autumn.	Difference of the Coldest and Warmest Months.	Yearly Means.		Fluctua- tion.
										Max.	Min.	
North Island.												
Mongonui -	35 1	173 28	10	59°90	53°06	58°28	66°56	61°52	15°12	89°10	31°82	57°28
Auckland -	36 50	174 51	20	59°54	52°34	57°56	66°92	61°16	16°02	88°52	33°26	55°26
Taranaki -	39 4	174 5	14	57°56	50°90	55°94	64°58	58°82	15°66	86°90	30°02	56°88
Napier -	39 29	176 55	10	57°56	49°10	57°74	66°20	57°02	19°28	90°00	32°10	59°90
Wellington -	41 16	174 47	14	55°58	48°74	54°50	62°24	55°66	14°76	78°44	32°18	46°26
Wanganui -	39 56	175 6	3	55°90	48°71	53°31	63°31	57°12	16°70	86°00	29°00	55°00
South Island.												
Nelson -	41 16	173 19	11	54°86	46°58	54°50	62°78	55°76	17°10	82°04	27°32	54°72
Hokitika -	42 42	170 59	10	52°34	45°50	51°02	59°18	53°06	14°76	74°12	23°22	46°90
Bealey -	43 2	171 31	9	46°76	37°40	46°04	54°56	46°56	18°18	78°08	12°38	66°70
Christchurch -	42 33	172 39	12	52°88	43°52	53°24	61°52	53°60	18°72	88°16	25°16	63°00
Dunedin †	45 52	170 31	17	50°72	43°52	50°54	57°20	51°80	15°30	84°74	23°84	54°90
Invercargil -	46 17	168 20	14	50°36	42°26	51°26	58°10	50°00	16°82	83°84	20°12	63°72
Queenston ‡	46 2	165 39	3	51°01	40°01	50°92	64°02	52°31	21°25	84°60	23°21	61°39

Height above sea, 2,104 feet.

† Height above sea, 550 feet.

‡ Height above sea, 1,070 feet.

## II.—MONTHLY MEANS.

—	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
Mongonui - -	66°20	67°10	67°28	65°30	62°60	56°66	53°96	52°88	52°16	55°04	58°46	61°16
Auckland - -	65°30	67°82	67°82	65°48	61°70	56°30	52°88	51°80	52°34	54°86	57°74	60°26
Taranaki - -	62°78	65°66	65°48	62°42	59°36	54°68	51°80	50°72	50°00	53°24	55°76	59°00
Napier - -	65°48	65°48	67°46	61°88	57°38	51°62	48°20	49°28	50°00	54°14	58°46	60°80
Wellington - -	60°80	62°96	63°14	60°26	57°02	52°70	49°46	48°38	48°38	51°80	54°32	57°20
Wanganui - -	63°90	62°51	63°58	60°81	56°32	53°72	49°58	48°12	49°01	52°97	55°11	58°23
Nelson - -	61°16	63°32	63°68	60°26	56°84	50°36	46°76	46°58	46°58	51°26	54°32	57°74
Hokitika - -	58°64	59°00	59°90	56°48	53°60	49°28	46°04	45°14	45°50	49°28	51°44	54°14
Bealey - -	53°96	55°04	55°40	52°52	49°46	43°70	37°58	37°40	37°22	43°52	45°50	46°28
Christchurch - -	60°62	61°88	61°88	57°92	54°68	48°02	43°34	43°16	43°88	49°64	53°06	57°20
Dunedin - -	56°66	56°84	57°92	55°40	51°98	48°02	44°24	42°62	43°88	47°46	51°26	53°88
Invercargil - -	57°74	58°28	58°46	54°32	50°18	45°32	41°72	41°54	43°52	48°92	50°72	53°96
Queenston - -	59°98	60°98	60°48	57°92	51°62	47°01	39°91	39°27	40°21	45°12	51°12	55°87

## III.—DAILY RANGE OF TEMPERATURE.

## a. Difference of the Mean Daily Extremes.

—	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Year.
Mongonui -	15°48	16°74	15°30	19°08	18°18	16°92	15°30	15°66	16°92	16°02	14°58	16°74	16°38
Auckland -	18°90	19°80	20°88	19°80	19°08	16°92	15°30	15°48	16°74	15°84	16°56	18°00	17°82
Taranaki -	19°62	21°60	20°16	21°42	19°44	15°84	15°30	14°40	16°56	18°00	16°74	18°54	18°18
Napier -	18°72	21°60	21°78	17°82	15°12	14°94	13°86	15°30	15°12	18°00	18°18	19°08	17°46
Wellington -	13°32	13°50	12°42	12°42	11°70	11°16	10°62	10°62	11°52	11°88	12°24	13°50	12°06
Nelson -	20°34	23°40	20°70	21°24	17°10	17°82	19°08	19°08	19°62	21°06	21°42	22°14	20°16
Hokitika -	11°34	11°16	13°32	12°60	12°78	13°66	14°58	13°68	14°76	15°66	12°24	11°52	13°14
Christchurch -	17°10	18°36	16°56	17°46	17°10	16°38	14°94	16°56	16°02	16°20	18°54	19°08	17°10
Dunedin -	16°20	15°66	15°66	15°12	13°68	11°52	10°44	10°62	12°06	13°32	13°68	15°30	13°68
Invercargil -	22°50	21°78	22°50	22°68	18°00	16°02	17°64	16°92	19°44	22°32	21°06	21°06	20°16

Comparison between climate on east and west coasts.

The climate on the west coast of both islands is more equable than on the east, the difference between the average summer and winter temperature being nearly 4° greater on the south-east portion of the North Island and 7° on that of the South Island than on the south-west, on which the equatorial winds impinge. This constant wind is the most important feature in the meteorology of New Zealand, and is rendered more striking by comparing the annual fluctuation of temperature on the opposite sea boards of the South Island, which have a greater range of temperature by 18° at Christchurch on the east than at Hokitika on the west.

## c. Rainfall.

Rainfall in northern portion of Island.

The observations that have been taken show that the northern part of New Zealand is within the influence of the sub-tropical winter rainfall. The probability of rainfall in winter in that part of the colony being twice as large as in summer.

In southern.

In the south, however, the rainfall though irregular, is distributed more equally over the year. The chief difference to be observed, is that on the west coast spring rains prevail, and summer rains on the east coast; while in the middle of the colony the driest season is autumn, and in the south it is the winter and spring.

Contrast between east and west coasts.

The contrast between the rainfalls on the east and west coasts, as with the temperature, is most striking. Thus, in the North Island, Napier on the east has only half the amount of rain that falls in Taranaki on the west. But the South Island with its longitudinal range of lofty mountains, exhibits the feature in a still more marked manner, for the rainfall on the west is nearly five times the amount on the east. The excess of precipitation on the coast is clearly illustrated by the distribution of the glaciers on the opposite sides of the range. Those on the west slope have an excessive supply of snow, and descend to a line where the mean annual temperature is 50° Fahr., while on the east slope they descend only to the mean annual temperature of 37°. The winter snow line on the southern Alps, on the east side is 3,000 feet, and that on the west side is 3,700 feet.

## I.—REVIEW OF THE PROPORTIONS OF RAIN IN NEW ZEALAND.

Stations.	Rainfall.					Probability of Rain.					Mean Max. in 24 Hours.
	Winter.	Spring.	Summer.	Autumn.	Total for Year.	Winter.	Spring.	Summer.	Autumn.	Year.	
<i>North Island.</i>											
	Per-centage.				Inches.						
Mongonui - - -	36	24	23	17	58.182	0.66	0.50	0.33	0.39	0.47	3.500
Auckland - - -	33	25	19	24	47.008	0.61	0.52	0.35	0.41	0.47	3.358
Taranaki - - -	29	27	20	23	59.442	0.52	0.51	0.35	0.38	0.44	2.520
Napier - - -	39	15	35	11	36.004	0.26	0.23	0.24	0.17	0.22	—
Wellington - - -	29	24	24	22	51.542	0.51	0.48	0.37	0.40	0.43	2.610
<i>South Island.</i>											
Nelson - - -	27	26	29	17	61.599	0.27	0.25	0.22	0.18	0.23	7.189
Hokitika - - -	24	28	28	20	111.653	0.52	0.61	0.57	0.48	0.54	3.532
Bealey - - -	22	28	31	18	106.340	0.53	0.61	0.56	0.47	0.54	3.512
Christchurch - - -	31	21	25	23	25.536	0.36	0.33	0.28	0.24	0.30	1.622
Dunedin - - -	23	23	28	26	31.682	0.51	0.55	0.58	0.54	0.54	2.079
Southland - - -	26	23	26	26	49.732	0.47	0.47	0.40	0.49	0.46	1.130

## II.—TOTALS OF MONTHLY RAINFALL IN INCHES.

—	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
Mongonui - - -	2.339	3.209	7.787	1.492	2.882	5.461	8.319	6.598	6.241	5.831	3.701	4.272
Auckland - - -	3.409	2.071	3.272	3.150	3.402	4.771	5.721	5.279	4.351	4.331	3.520	3.752
Taranaki - - -	4.921	3.221	3.908	2.579	3.520	7.730	5.914	6.229	5.177	5.252	5.969	4.858
Napier - - -	5.630	3.571	3.650	1.130	1.353	1.532	3.402	3.681	6.370	2.441	1.539	1.201
Wellington - - -	3.999	3.832	4.453	3.780	3.280	4.540	5.212	5.658	4.299	3.941	5.000	3.500
Nelson - - -	4.319	5.358	8.331	2.063	3.221	5.177	4.441	6.319	6.233	6.319	5.000	4.815
Hokitika - - -	12.169	8.902	9.871	6.732	8.611	6.370	8.240	9.638	9.130	5.875	13.402	12.690
Bealey - - -	14.087	9.631	8.902	3.921	7.433	8.079	5.019	10.378	7.799	5.811	15.501	8.733
Christchurch - - -	1.622	2.311	2.570	1.752	1.811	2.280	3.189	2.449	2.319	1.161	2.142	2.130
Dunedin - - -	3.012	3.599	2.142	2.220	2.123	3.949	2.441	2.500	2.228	2.000	2.500	2.969
Southland - - -	3.622	5.279	3.921	3.980	3.571	5.401	5.019	3.441	4.390	2.661	3.929	4.520

## III.—PROBABILITY OF RAIN.

—	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Range.
Mongonui - - -	0.37	0.33	0.30	0.22	0.34	0.60	0.67	0.63	0.69	0.62	0.54	0.34	0.47
Auckland - - -	0.38	0.29	0.32	0.30	0.38	0.56	0.64	0.56	0.63	0.56	0.52	0.47	0.35
Taranaki - - -	0.39	0.51	0.35	0.25	0.38	0.51	0.51	0.50	0.54	0.49	0.55	0.48	0.29
Wellington - - -	0.40	0.34	0.37	0.30	0.40	0.51	0.50	0.52	0.50	0.47	0.44	0.38	0.22
Hokitika - - -	0.64	0.57	0.48	0.46	0.55	0.44	0.46	0.55	0.56	0.47	0.71	0.66	0.27
Christchurch - - -	0.30	0.28	0.27	0.24	0.21	0.26	0.38	0.34	0.36	0.27	0.37	0.34	0.17
Dunedin - - -	0.55	0.60	0.58	0.55	0.56	0.54	0.51	0.46	0.56	0.49	0.60	0.58	0.14
Southland - - -	0.35	0.48	0.36	0.38	0.53	0.55	0.51	0.46	0.44	0.32	0.54	0.54	0.23

## IV.—MAXIMA OF RAINFALL IN INCHES.

—	Auckland.	Taranaki.	Wellington.	Nelson.	Christchurch.	Dunedin.	Southland.
Monthly Max.	14.140	16.598	10.358	19.961	6.079	10.069	10.084
—	February.	May.	September.	October.	June.	May.	January.
Yearly Max. -	57.300	86.069	51.542	79.370	30.041	50.795	63.699
Yearly Min. -	36.780	43.835	41.130	46.311	19.402	20.780	41.618

IV.—MAXIMA OF RAINFALL IN INCHES—*continued.*

—	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
Temperature -	54·3	54·4	53·6	51·2	50·4	52·0	50·9	50·7	49·8	49·0	51·0
Rain -	22·7	29·1	27·5	47·8	58·0	51·0	63·7	47·2	41·6	46·4	42·7

## Rainfall.

Periods of lasting drought are almost unknown in New Zealand, and only in two instances do the records show a whole month at any station without rain. The greatest day's rain recorded is  $6\frac{1}{2}$  inches at Auckland and  $9\frac{1}{2}$  inches in Nelson.

Such heavy showers occur at the north-west stations, where the general average shows 70 inches in 85 days in the year. The opposite extreme is on the south-east, where 34 inches fell in 180 days.

d. *Pressure of Air.*

**Average pressure.** The mean atmospheric pressure in New Zealand between lat.  $37^{\circ}$  and  $46^{\circ}$  S. decreases from 29·981 to 29·804 inches. The average pressure being for all stations 29·919. For the corresponding north latitudes the average pressure is 30·005, but in the New Zealand area the fluctuations are much greater, and though frequent, are tolerably regular in those periods. The maximum pressure occurs in April and the minimum in November. The extreme range of the Barometer is a little over 2 inches, and the average daily range from hourly observations is 0·043 inches.

**Maximum.**

The following are the observed averages of pressure for a few of the principal stations:—

## I.—PRESSURE OF AIR IN INCHES, 29·000 +.

—	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Year.
Auckland -	·417	·402	·433	·508	·535	·425	·390	·413	·382	·378	·396	·354	29·981
Taranaki -	·346	·339	·354	·480	·492	·394	·358	·370	·303	·287	·284	·280	29·618
Nelson -	·366	·307	·350	·417	·433	·366	·402	·433	·350	·350	·154	·232	29·906
Christchurch -	·280	·256	·319	·406	·421	·354	·366	·358	·319	·323	·220	·173	29·874
Hokitika -	·331	·343	·327	·465	·472	·469	·406	·437	·354	·386	·276	·260	29·946
Southland -	·205	·232	·291	·307	·343	·311	·303	·272	·213	·228	·123	·138	29·808

## II.—MONTHLY RANGE OF AIR PRESSURE.

—	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Year.
Auckland -	0·657	0·681	0·728	0·756	0·909	0·961	1·043	1·051	0·965	0·886	0·827	0·835	1·417
Taranaki -	0·740	0·883	0·886	0·984	1·028	0·917	1·094	1·138	1·024	1·051	0·929	0·752	1·594
Southland -	1·193	1·122	0·854	1·039	1·079	1·240	1·256	1·248	1·197	1·094	1·240	1·169	1·732

## III.—DAILY AMPLITUDE.

Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
0·038	0·034	0·038	0·044	0·050	0·046	0·041	0·048	0·044	0·050	0·042	0·042

## V.—HOURLY FLUCTUATION OF ATMOSPHERIC PRESSURE AND ELASTIC FORCE OF VAPOUR.

A.M.												
—	Midnight.	1	2	3	4	5	6	7	8	9	10	11
Bar - -	+ '013	- '001	- '003	- '012	- '010	+ '004	- '006	- '006	- '005	- '003	- '001	- '011
El. Force -	- '021	- '017	- '011	- '017	- '011	- '014	- '006	- '003	+ '010	+ '008	+ '011	+ '018

P.M.												
—	Noon.	1	2	3	4	5	6	7	8	9	10	11
Bar - -	- '012	- '012	- '016	- '010	- '008	- '003	+ '007	+ '019	+ '025	+ '021	+ '020	+ '019
El. Force -	+ '020	+ '025	+ '021	+ '013	+ '006	+ '009	+ '003	- '002	- '006	- '006	- '007	- '011

## c. Winds.

There is a marked prevalence of westerly winds throughout all seasons, and Westerly winds in all parts of New Zealand, but they are much modified by the form of the land. North-east or countertrades impinge on the north-east coast especially North-easterly, during the summer months, bringing rain; and cold south-easters, having winds. heavy storms of rain and snow, occur during winter in the south, but only on rare occasions.

The westerly winds begin in the N.N.W. with heavy rain on the west coast, Action of winds. and gradually veer to S.W., when fair bright weather sets in on that coast; but the same south-west wind sweeping along the east side of the islands, bring heavy strong weather locally known as "southerly bursters" and which from the shape of the coast reach the region of Cook's Straits as S.E. storms; all the other winds are either land or sea draughts, with fine light weather, except on a few very rare occasions, while circular storms pass over the area.

## I.—APPROXIMATE WINDROSE.

Variations from the Mean, 29·919 inches.

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
+0·009	+0·006	+0·082	+0·071	+0·127	+0·097	-0·064	-0·112

## II.—FREQUENCY OF WIND IN PER-CENTAGES.

	North Island : Wanganui, Auckland, Taranaki.				South Island : Christchurch, Dunedin, Southland.				Hokitika : West Coast of the South Island.			
	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.
N. - - -	5	8	13	7	5	5	4	4	2	4	6	3
N.E. - - -	9	11	16	10	12	17	21	15	18	20	25	29
E. - - -	7	6	7	6	12	13	12	10	20	21	16	16
S.E. - - -	17	6	7	16	6	13	14	7	24	9	4	14
S. - - -	9	5	5	8	2	4	5	4	3	3	1	4
S.W. - - -	26	21	18	25	22	16	13	18	25	20	20	26
W. - - -	16	29	21	18	23	16	17	24	3	3	5	1
N.W. - - -	11	15	13	10	18	16	14	19	6	20	23	7

Thunderstorms are most frequent in the districts where the changes of wind are most suddenly felt, from the moist equatorial currents to the cold polar currents of the S.W. Thunderstorms.

Periods.

They are most frequent in spring on the west coast, except in the extreme southwest of Otago, where during winter some thunderstorms are of almost daily occurrence.

There being no westerly station on that part of the coast this does not appear in the following abstract :—

## AVERAGE FREQUENCY OF THUNDERSTORMS.

—	Mon- gonui.	Auckland.	Taranaki.	Hokitika.	Bealey.	Christ- church.	Dunedin.	South- land.
Seasons.								
Winter - -	4.0	1.0	2.0	3.0	2.3	0.8	0.8	6.0
Spring - -	7.7	3.0	7.2	5.5	7.0	0.4	3.2	6.0
Summer - -	6.9	10.0	5.5	4.0	6.2	1.0	2.7	11.0
Autumn - -	0.5	4.0	2.0	2.0	1.8	1.0	0.5	6.5
Year - -	18.2	18.0	16.7	14.5	17.3	3.0	7.2	29.5

Black bulb and radiation thermometer.

The difference in the amount of cloud in the atmosphere is best illustrated by a reference to the average readings of the black bulb and radiation thermometer, for which comparison the stations on the opposite sea coasts of the Southern Alps has been tabulated; but the extreme readings of the black bulb thermometer, especially at the southern stations, are very remarkable, as they frequently reach to 175° Fah.

—	Christchurch, East Coast, 42° 33' S.L.			Hokitika, West Coast, 42° 42' S.L.		
	Insolation.	Radiation.	Difference.	Insolation.	Radiation.	Difference.
Seasons.						
Summer - -	131.72	44.78	86.94	84.02	46.38	35.64
Autumn - -	111.92	37.94	73.98	73.04	41.73	31.32
Winter - -	91.22	28.04	63.18	61.70	33.44	28.26
Spring - -	124.52	34.34	90.18	75.02	39.56	35.46
Year - -	158.00	14.54	143.46	97.34	21.92	75.42

## IV.—STATISTICS.

## a. Census Results.

Colony founded in 1839.

The colony of New Zealand was founded in 1839. Since that period seven censuses have been taken. While seven years elapsed between the first and second census, the succeeding enumerations were taken at intervals of about three years. Recent legislation has caused the date of taking the next census to be postponed so as it may approximate to the date on which the Imperial Census is taken.

White population.

The following table exhibits the population exclusive of the aborigines when each census was taken :—

Date of Enumeration.	Population.			Centesimal increase.	Number of Inhabited Houses.
	Persons.	Males.	Females.		
December 1851 -	26,707	15,035	11,672	—	—
24 December 1858 -	59,413	33,679	25,734	122.46	12,812
December 1861 -	61,062	37,959	23,103	39.99	22,398
December 1864 -	106,580	65,578	41,002	73.86	37,996
December 1867 -	131,929	86,739	45,190	27.01	54,015
February 1871 -	150,356	106,087	44,269	16.82	57,182
1 March 1874 -	170,981	128,533	42,448	73.98	61,356

Military not included.

In the above numbers the military and their families have not been included, as they did not constitute a portion of the settled population of the colony and have now been all removed.

In March 1874 there were 75·17 females to every 100 males, but in that proportion the Chinese population were included, and as they do not come to the colony with a view to permanent settlement and do not bring their women with them, a juster estimate of the general population would be made by estimating the proportion exclusive of the Chinese. The proportion thus arrived at would be 100 males to 77·35 females. The number of Chinese amounted to 4,816, of whom two were females.

Proportion between the sexes inclusive of Chinese.  
Exclusive of Chinese.  
Number of Chinese.

As in 1871 there were 100 males (exclusive of the Chinese and Maoris) to 71·88 females, the proportion of females largely increased during the three years 1871-1874. In 1874 the proportions between the sexes varied in different portions of the colony, having been lowest in Westland, caused by the presence of a considerable male gold-digging population. The following were the proportions (excluding the Chinese) in the different provinces in 1874:—

Increase of proportion of white females

Proportions in different provinces in 1874.

Auckland to every 100 males,	81·80 females.
Taranika	79·64
Wellington	83·40
Hawkes Bay	70·42
Marlborough	67·94
Nelson	68·15
Westland	62·83
Canterbury	82·03
Otago	75·16

The extent to which the proportion of females is reduced by the presence of a digging population may be shown by the following proportions:—

Proportion of females within and without radius of gold-fields.

In Otago within the goldfields to every 100 males there were	58·88 females.
" outside	100
In Nelson within	100
" outside	100
	79·66
	41·67
	92·16

*Density of Population.*—The population of the colony, exclusive of Maoris, amounted in March 1874 to 2·855 persons to a square mile; but as 105,213 persons resided in towns, the population outside towns, numbering 194,301, only amounted to 1·85 persons to a square mile. The population was most dense in the Province of Canterbury, amounting there to 4·328 persons to a square mile, and least dense in the Province of Marlborough, where it only amounted to 1·446 persons to a square mile.

In towns.  
Outside towns.

The average number of persons to an inhabited dwelling throughout the colony was 4·88 in 1874, against 4·48 in 1871, and 4·05 in 1867. But while the average number of persons to each dwelling was on the increase, the average character of the dwellings was evidently improving, and their capacity for occupation by a larger number of persons becoming greater.

Average number to each dwelling.

The following table will show the increase or decrease in the number of the dwellings containing respectively one or two rooms, three or four rooms, and five or more rooms:—

	Total Number of Dwellings, including Tents.	Number of Dwellings containing				Number of dwellings.
		One or two Rooms, including Tents.	Three or four Rooms.	Five or more Rooms.	Number of Rooms not stated.	
1871 -	57,182	22,998	17,738	16,446	—	
1874 -	61,856	19,612	21,027	19,679	1,033	
Increase -	4,174	—	3,289	3,233	1,038	
Decrease -	—	3,386	—	—	—	

In addition to the 61,356 inhabited dwellings there were 3,967 unoccupied dwellings and 535 dwelling houses that were being built. Of this total of 55,858 dwellings, 2,042 were built of brick or stone, 54,523 of wood and iron, Materials.

Unoccupied dwellings.  
Materials.

2,546 of sod, or similar material, 572 of raupo (viz., a framework thatched with raupo or bullrush), 2,937 were described as huts of sod clay, wood, or stone, and 1,967 were tents or dwellings with canvas roofs. The materials of 1,271 dwellings were not specified. In addition to the above dwellings, 4,401 buildings were returned as stores, warehouses, workshops, business premises, and buildings used for offices only.

Comparative  
population of  
towns.

*Cities and Towns.*—There were, in 1874, 85 defined cities or towns having a population of 100 persons and upwards.

1	had a population exceeding 18,000.
3	had each a population between 10,000 and 13,000.
2	" " 5,000 and 10,000.
9	" " 2,000 and 5,000.
4	" " 1,000 and 2,000.
14	" " 500 and 1,000.
52	" " 100 and 500.

Of these towns 35 were in Otago, 16 in Auckland, 11 in Wellington, 6 in Westland, 5 in Canterbury, 6 in Nelson, 2 in Hawkes Bay, 2 in Taranaki, and 2 in Marlborough.

The following are some of the principal towns with their population in 1874. As the population of Christchurch and Auckland cannot fairly be estimated without taking the suburbs into account, these have also been given :—

		Persons.	Males.	Females.
Towns, with their population.	Auckland borough - - -	12,775	6,648	6,127
	" suburbs, Parnell Newton - -	8,815	4,350	4,465
	Thames borough - - -	8,073	4,345	3,728
	Onehunga - - -	2,044	987	1,057
	New Plymouth - - -	2,044	1,020	1,024
	Wellington - - -	10,547	5,344	5,023
	Wanganui - - -	2,572	1,318	1,254
	Napier - - -	3,514	1,845	1,669
	Nelson - - -	5,662	2,765	2,897
	Hokitika - - -	3,352	1,695	1,657
	Greymouth - - -	2,531	1,421	1,130
	Christchurch borough - - -	10,294	5,330	4,964
	" suburbs - - -	6,665	3,361	3,304
	Lyttelton - - -	2,974	1,612	1,362
	Oamaru - - -	2,819	1,547	1,272
	Dunedin - - -	18,499	9,529	8,970
	Invercargil - - -	2,479	1,290	1,189

Ages of the  
people.

*Ages of the People.*—Of the 299,514 persons enumerated on the 1st March 1874, 5,850 males and 5,576 females were infants under the age of one year. There were, including these infants, 51,888 under five years of age, viz., 26,111 males and 25,777 females. The numbers at the ages usually recognised as the school ages, i.e., five and under 15 years, amounted to 72,147, viz., 36,423 boys and 35,724 girls. The total number under 15 years of age was thus, 124,035, viz., 65,534 males and 61,501 females. There were 13,351 youths and 12,926 young women, or a total of 26,277 persons at the ages of 15 to 21. Thus while during the first year of age there were 100 males to 95·32 females (the proportion of females being somewhat less than that in which the births occurred, to every 100 males born in 1873, there having been 96·64 females born), there were 100 males under 21 years of age to 98·08 females at the same ages. The children under five years of age amounted to 17·36 of the population, the children of five and under 15 years amounted to 24·14 per cent. of the population, and the young persons of 15 and under 21 years of age amounted to 8·79 per cent. of the population, the total number of persons of 15 and under 21 years of age amounting to 50·29 per cent. of the population. The total number of persons of 21 years and under 40 was 99,120, viz., 61,867 males and 37,253 females. The persons of 40 years of age and under 65 numbered 45,834, viz., 30,583 males and 15,251 females. The number at 65 years of age and upwards amounted to 3,651, 2,171 being males and 1,480 females. There were 197 persons, viz., 100 males and

97 females, between 80 and 90 years of age, three males and six females between 90 and 93 years of age, and four males and three females between 94 and 97 years of age. One male was returned at the advanced age of 103, and one at the extraordinary age of 116. The latter repeatedly stated that he remembered Captain Cook being at Tahiti.

The following table shows the proportion per 10,000 persons at the ages specified in New Zealand and the adjacent Australian colonies :—

Ages.	New Zealand.	Victoria.	South Australia.	New South Wales.	Queensland.
	1874.	1871.	1871.	1871.	1871.
Under 15 years -	4,150	4,233	4,180	4,513	3,896
15 to 65 years -	5,728	5,629	5,607	5,304	6,005
65 years and upwards	122	138	213	183	99
Total -	10,000	10,000	10,000	10,000	10,000

Population, with proportion at several ages.

The proportion of the population of New Zealand at the supporting period of life, viz., 15 to 65, in 1874, was greater than in the adjacent colonies in 1871, Queensland excepted.

Working proportion of population.

The following are the numbers per 1,000 persons at the age periods under 20, 20 to 60, and 60 and upwards in New Zealand in 1874, and the corresponding numbers in England and Wales in 1871 :—

Comparison between mother country and colony.

Ages.	England and Wales.	New Zealand.
	1871.	1874.
	per 1,000	per 1,000
Under 20 - -	457·24	487·64
20 and under 60 -	469·27	489·00
60 and upwards -	73·49	23·36
Total -	1,000·00	1,000·00

The following table represents the total number at each age period specified :—

#### GENERAL SUMMARY OF AGES OF POPULATION.

TABLE showing the NUMBER of PERSONS, MALES and FEMALES, (exclusive of Maoris) living at 3 periods of ages.

Population at three periods of age.

	Numbers.		
	Persons.	Males.	Females.
All ages - - -	299,514	170,931	128,533
Specified ages - - -	298,917	170,506	128,411
Up to 20 years - - -	145,765	73,451	72,314
From 20 to 60 years - - -	146,169	92,895	53,274
Over 60 years - - -	6,983	4,160	2,823
Unspecified - - -	597	475	122

**Chinese.** The Chinese included in the above numbers amounted to 4,916 persons, viz., 4,814 males and two females.

Of these, 200 males and one female were of ages up to 20 years, 4,581 males and one female from 20 to 60 years, 16 males over 60 years, and 17 unspecified.

**Half-castes.** Of the Chinese population those under 15 years of age should more correctly be styled half-castes, as it appears that in most if not all cases they were the offspring of Chinese men and European women their wives.

**Religions.** *Religions.*—Out of a population of 299,514, the persons who objected to state their religious belief amounted to 6,760. No entry was made in the column for “religion” in the household schedules opposite the names of 955 persons.

**Numbers to each creed.** The following table gives a summary of the numbers of each religious denomination:—

Religious Denomination.	Persons.	Males.	Females.
Church of England and Protestants not otherwise defined.	127,171	72,357	54,814
Presbyterians - - - -	72,477	41,030	31,447
Wesleyans and other Methodists -	25,219	12,980	12,239
Baptists - - - -	6,355	3,232	3,123
Congregational Independents - -	5,441	2,896	2,545
Lutherans - - - -	3,914	2,668	1,246
Unitarians - - - -	349	224	125
Society of Friends - - - -	156	111	45
Other Protestants - - - -	2,679	1,429	1,250
Roman Catholics and Catholics undefined	40,271	22,543	17,828
Greek Church - - - -	41	40	1
Jews - - - -	1,215	701	514
Mormons - - - -	62	56	6
Mahometans - - - -	17	17	—
Pagans (Chinese) - - - -	4,764	4,764	—
Other denominations - - - -	135	92	43
No denomination - - - -	1,281	785	496
No religion - - - -	152	121	31
Unspecified - - - -	955	704	251
Objecting to state their religion -	6,760	4,231	2,529

**Total number of Protestants of all denominations.** The Protestants of all denominations amounted to 243,761; the Catholics, including the Greek Church, to 40,412. Of the Protestant denominations the members of the Church of England (including Protestants not otherwise defined) amounted to 127,171 or 42·46 per cent of the population. The Presbyterians numbered 72,477 or 24·20 per cent., and the Methodists numbered 25,219 or 8·42 per cent. of the population. The Roman Catholics numbered 40,371 or 13·48 per cent. of the population. Of these principal denominations the Church of England has increased most in proportion since 1871, the proportions to the 100 of the population having been respectively in 1871 and 1874 as follows:—

1871, 1874.	1871.	1874.
Church of England - - -	41·83	42·46
Presbyterians - - -	24·84	24·20
Roman Catholics - - -	13·89	13·48
Methodists - - -	8·58	8·42

**Increase of various sects.** Of the smaller bodies the Baptists increased from 4,732 or 1·85 per cent. to 6,355 or 2·12 per cent., the Congregational Independents from 3,941 or 1·54 per cent. to 5,441 or 1·82 per cent., and the Lutherans from 2,341 or 0·91 per cent. to 3,914 or 1·31 per cent. Hebrews decreased from 1,262 or 0·49 per cent. to 1,215 or 0·40 per cent. Pagans (embracing nearly all the Chinese) increased from 2,612 or 1·02 per cent. to 4,764 or 1·59 per cent. The number of persons who objected to state their religious belief was reduced from 8,630 in 1871 to 6,760 in 1874.

*Birthplaces.*—The birthplaces of 299,008 persons were returned in the household schedules. No birthplaces were given for 506 persons. Of these 506 there were 365 who had British names, 21 had foreign names, 120 of the 506 omitted to give any names in the schedules. Birthplaces.

*Allegiance.*—The number of British subjects in the colony in 1874 amounted to 286,109, or 95·56 per cent. of the population whose allegiance could be ascertained. In this number was included all persons born in British possessions, all naturalised British subjects, British subjects born in foreign countries, persons having British names born at sea, and those whose birthplaces were not given, but who had British names. The foreign subjects amounted to 13,285 or 4·44 per cent. Allegiance.

*Numbers born in New Zealand.*—The persons in New Zealand in March 1874 who were born in the colony numbered 122,635; of these 61,779 were males and 60,856 were females. The total amounted to 40·94 per cent. of the whole population. The number of New Zealand born in 1871 was 93·474. There has thus been an increase of 29,161 or 31·20 per cent. on the New Zealand born population. (The population as given does not include the Maoris or native aboriginal tribes.) Number born in Colony.

*Numbers born outside the Colony.*—The Australian born were 13,601 in 1874, an increase in the three years of 1,175 or 9·46 per cent. The English born increased from 67,044 in 1871 to 74,628 in 1874 or 11·31 per cent. The Scotch increased from 36,871 to 38,431 or 4·24 per cent.; the Irish increased from 29,733 to 30,255 or 1·76 per cent; and the Germans increased from 2,416 to 2,819 or 16·68 per cent. Born outside Colony.

Numbers of  
different  
nationalities.

THE COLONY, CITIES AND TOWNS, OUTSIDE TOWNS, AND GOLD FIELDS.

TABLE showing the NUMBER OF PERSONS, MALES AND FEMALES of different NATIONALITIES in the COLONY OF NEW ZEALAND (exclusive of the MAORIS), in the TOWNS (of a Population of 500 and upwards), OUTSIDE TOWNS, and on GOLD FIELDS.

\*\* The Numbers for the Colony are the additions of the Town and Outside Town Populations; the Gold Field Numbers belong to each of these Divisions.

Where Born.	Colony.			Towns of 500 inhabitants and upwards.			Outside Towns.			Gold Fields.		
	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.
All nationalities	299,514	170,981	128,532	105,213	54,785	50,448	194,301	116,216	78,085	40,153	32,365	16,287
British Possessions:												
New Zealand	122,635	61,779	60,856	42,922	21,021	21,901	79,713	40,750	38,965	14,654	7,395	7,259
Australian Colonies	13,601	7,018	6,583	6,651	3,183	3,468	6,960	3,335	3,115	3,253	1,676	1,677
England	74,628	45,349	29,279	29,253	16,214	13,039	46,375	29,135	16,340	9,728	6,910	2,818
Wales	1,381	988	443	407	249	158	974	689	285	390	321	69
Scotland	38,431	23,279	15,158	11,466	6,231	5,235	26,935	17,084	9,867	6,063	4,368	1,706
Ireland	30,255	18,013	12,242	9,978	4,856	5,114	20,283	13,155	7,128	7,747	5,296	2,461
Other British Possessions	3,068	1,871	1,187	1,049	597	453	2,009	1,274	755	404	367	127
Foreign Countries:												
France and French Colonies	569	437	132	243	157	86	326	280	46	133	116	17
Germany	2,819	2,068	751	839	609	230	1,980	1,459	521	673	586	87
Other European Countries	4,396	3,391	1,005	1,223	827	395	3,174	2,534	640	1,160	1,106	54
* United States of America	575	477	98	206	153	53	367	324	43	129	115	14
China	4,928	4,323	5	168	165	3	4,660	4,558	2	4,431	4,431	-
Other Countries	893	641	252	319	217	102	574	424	150	153	125	27
At sea	839	500	339	356	180	176	533	320	213	107	59	46
Unspecified	506	397	109	106	74	34	398	323	75	38	34	4

\* 699 persons, namely, 501 males and 198 females, returned their birthplace as America only, and are included in other countries.

*Conjugal condition of the people.*—In 1874, out of every 100 of the male population (excepting Chinese) 27·28 were married, and 72·72 were single; and, of the female population, in every 100 34·72 were married, and 65·28 were single, while the proportion of married males has increased from 26·23 per cent. in 1867 to 27·28 per cent. in 1874, the proportion of married females decreased from 37·59 per cent. in 1867 to 34·72 per cent. in 1874. The decrease in the proportion of married in the 100 females is attributable to the greater increase in the number of females under 21 years of age. In 1867 the females under 21 years amounted to 54·87 per cent. of the whole number of females, in 1871 to 56·82 per cent., and in 1874 to 57·96 per cent. 117,085 males were returned in 1874 as unmarried, of these 73,232 were under 20 years of age, and 43,853 were over 20 years of age. Of the females 79,388 were unmarried, of whom 61,500 were under 15 years of age, and 18,388 over 15.

Proportion of married and unmarried.

There were thus 25,465 bachelors of 20 years of age and upwards in excess of the number of spinsters of 15 years of age and upwards. To every 100 spinsters there were therefore 238 bachelors. Of the 18,388 spinsters 9,942 were from 15 to 20 years of age, and 8,446 at 20 and upwards. The marriages in 1873 of spinsters under 20 years of age amounted to 473, and of spinsters at 20 and upwards to 1,578, at that rate about 4·76 per 100 of the spinsters under 20 years of age, and 18·68 per 100 of the spinsters over 20 years of age, would be married in the year.

The husbands in 1874 numbered 45,334, the wives 44,624, the husbands being most numerous by 710. There was an excess of husbands over wives in every province except Westland, where the wives were the most numerous, the husbands having been 2,084, and the wives 2,094.

Husbands and wives.

The widows amounted to 3,990, being in excess of the widowers by 719, the latter only amounting to 3,271. The widows were more numerous than the widowers at all ages, except at the periods 40–45 and 45–50. At the ages 40 to 45 the widows were 431, and the widowers 483; at 45–50 the widows were 373, and the widowers 419, but if more extended periods are taken the widows will be found in all cases most numerous, but especially so at the extremes, i.e., at the youngest and oldest periods. Under 30 years of age the widows numbered 275, the widowers 107; from 30 to 50 years of age the widows numbered 1,565, the widowers 1,494; at the age of 50 and upwards the widows were 2,150, the widowers 1,670. Thus to every 100 widows under 30 years of age there were 39 widowers; at the ages 30 to 50 to every 100 widows there were 95 widowers; and at 50 years of age and upwards to every 100 widows there were 78 widowers.

Widows and widowers.

Under 30 years; from 30 to 50 years; 50 and upwards. Proportion at various ages up to 50.

At the higher ages the married men (with wives living) were more numerous than the married women, but at the same ages the widows were more numerous than the widowers. At the ages 65 and upwards there were 1,385 married men to 646 married women, while at the same period there were 785 widows to 545 widowers. The number of married women in the colony in 1874 between 15 and 45 years of age was 36,588.

At the higher ages.

The number of legitimate births in 1873 was 11,063, or 30·24 births to every 100 married women at 15–45, or on an average one child was born to every married woman at that age period every 3·31 years. In England in 1871 the number of married women of 15 to 45 amounted to 2,600,768, the legitimate births in 1870 to 748,050 or 28·76 births to every 100 married women at 15 to 45, or one birth to each such married woman in 3·48 years. The married women comprised in the age period 15–45 are generally younger than the married women of the same age period in England. Taking the whole number of married women in each country between the ages 15–45 as a basis of comparison, the following figures show the proportions per cent. at the respective ages in England and New Zealand:—

Legitimate births.

Proportion to the 100 married women at the ages 15 to 45.

Proportion of married women from 15 to 45.

Ages.	England.	New Zealand.
Under 20	1·33	2·37
20–40	80·01	83·70
40–45	18·66	13·93

Chinese married  
and unmarried.

*Conjugal condition of Chinese.*—The instructions in the household schedule were that Chinese were to be set down as unmarried unless they either have, or have had wives in New Zealand. 28 Chinese have thus been returned as married, one of whom had a Chinese wife. The schedules evince the fact that in many of the instances the wife was a European resident in New Zealand, but in some cases the correctness of the description cannot be tested, as men alone are given in the schedule. There is not however any reason to doubt the correctness of these returns.

Occupations.

*Occupations of the people.*—Of a total of 299,514 persons there were only 1,911 whose occupations could not be ascertained. The following table shows the occupations classified into certain orders and sub-orders :—

**THE COLONY, CITIES AND TOWNS, OUTSIDE TOWNS, GOLD FIELDS.—OCCUPATIONS.**

**TABLE showing the OCCUPATIONS of the COLONY, of CITIES and TOWNS having a POPULATION of 500 and upwards, OUTSIDE TOWNS, and on GOLD FIELDS; PERSONS, MALES, and FEMALES (exclusive of MAORIS) on the 1st March 1874.**

\* \* The Numbers for the Colony are the additions of the Town and Outside Town Populations; the Gold Fields Numbers belong to each of these Divisions.

Occupations of Persons of both Sexes.	The Colony.			Cities and Towns of 500 Inhabitants and upwards.			Outside Cities and Towns.			Gold Fields.		
	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.
<b>Total Population.</b>	299,514	170,981	128,533	105,213	54,765	50,448	194,301	116,216	78,085	49,152	32,845	16,287
<b>Class 1. Professional:—</b> Persons engaged in the General or Local Governments, or in protection of the country Persons engaged in the learned professions and teachers	2,470 3,520	2,453 2,452	17 1,068	1,121 2,155	1,113 1,516	9 639	1,349 1,838	1,341 1,337	8 490	203 404	202 317	1 87
<b>Class 2. Domestic:—</b> Persons engaged in the domestic offices of wives and mothers, and in personal offices for men	184,983	62,747	122,216	70,260	23,380	46,880	114,703	39,397	75,366	24,289	8,601	15,688
<b>Class 3. Commercial:—</b> Persons who buy or sell, keep or lend money, houses, or goods of various kinds Persons engaged in the conveyance of men, animals, goods, and messages	5,088 8,209	4,836 8,182	252 27	2,892 3,381	2,722 3,367	170 14	2,196 4,828	2,114 4,815	82 13	801 798	768 798	33 —
<b>Class 4. Agricultural:—</b> Persons possessing, working, or cultivating land, raising or dealing in animals, or pursuits subsidiary thereto	34,300	33,689	701	2,020	1,995	25	32,270	31,684	676	3,016	2,975	41
<b>Class 5. Industrial:—</b> Persons engaged in working and dealing in art and mechanical productions Persons working and dealing in textile fabrics, in dress and fibrous materials Persons working and dealing in food and drink Persons working and dealing in animal and vegetable substances Persons working and dealing in minerals	10,402 7,169 4,429 3,127 21,160	10,380 4,075 4,512 3,118 21,154	72 3,064 117 9 6	6,138 4,439 2,546 563 3,964	6,082 2,921 2,281 562 3,962	56 2,198 67 1 2	4,264 2,680 2,081 2,624 17,196	4,246 1,714 2,031 2,526 17,192	16 963 30 8 4	966 789 806 389 15,396	963 403 785 368 15,395	3 376 20 1 3
<b>Class 6. Indefinite and Non-productive:—</b> Labourers and others Persons of property or rank (not returned under any office or occupation)	9,032 344	9,006 278	26 66	3,649 183	3,632 146	17 37	5,983 161	5,974 132	9 21	880 16	877 15	3 1
<b>Persons supported by the Community:—</b> (Pensioners, inmates of charitable institutions) Criminal classes No occupation stated	1,671 — — 1,911	1,149 — — 1,748	622 107 163	835 353 827	688 287 727	242 100	836 1,081	556 1,021	280 63	169 225	180 210	39 13

Education—  
on the standard  
of reading and  
writing.

*Education of the people.*—The information required to be given on the household schedule was, as to the measure of education, limited to reading and writing, reading only, or not able to read. Of the 299,514 persons enumerated the information under the above heads was not ascertained in respect of 2,243.

The instruction in the census schedule was, that only those Chinese who could read and write English were to be enumerated as able to read and write. Of the 4,816 Chinese in the colony, 60 males and the 2 females were returned as being able to read and write, and 11 males as being able to read only. Dealing with the population, exclusive of Maoris and Chinese, except for the census years previous to 1867, when the numbers of Chinese were not separately shown, it appears that in 1874, 68·15 per cent. could read and write, 8·09 per cent. could read only, and 23·76 per cent. could not read. The per-centage of those who could read and write is less than in any census year since 1858. The rates in the intervening years have been as follows:—

Rates from 1861  
to 1874.

1861	-	-	-	-	68·67 per cent.
1864	-	-	-	-	72·70 „
1867	-	-	-	-	71·35 „
1871	-	-	-	-	69·20 „
1874	-	-	-	-	68·15 „

Reasons why  
lowest in 1874.

The rate having been lowest in 1874 is attributable to the fact that in the earlier periods the proportion of males 21 to 40 years of age was greater than in 1874; and in 1874 the proportion of children under 10 years of age was greater than in the preceding years, the proportions in 1864 and 1874 respectively of persons of those ages having been in the whole population as follows:—

Comparison of  
10 years.

		Under 10 years.		21 to 40 years.
1864	-	26·37 per cent.	-	44·53 per cent.
1874	-	32·36 „	-	32·51 „

Per-centage of  
females.

The per-centage of females who could read and write was at each of the census periods considerably less than the per-centage of males who could read and write. In 1874, while 71·40 per cent. of the males could read and write, only 63·94 per cent. of the females could read and write. The per-centage of females able to read and write was less at all quinquennial periods of age, except at the periods 5 to 10, 10 to 15, and 15 to 20 years, when it was slightly in excess of the similar per-centage of the males.

School  
attendance.

*Attendance at School.*—In 1874, 34,407 children attended Government schools; 13,752 attended private schools, 7,947 attended Sunday schools only, 30,584 attended both week day and Sunday Schools, and 8,368 were receiving tuition at home. Thus 56,527 children were receiving secular tuition at school or at home, and religious instruction was being imparted in Sunday schools to 38,531 children. The total number of children at what is generally defined as the school going ages, 5 to 15, was 72,134, but the above numbers of those attending school, also include children under 5 years and over 15 who were attending school.

While the population at 5 to 15 years increased 31·73 per cent. between 1871 and 1874, the numbers attending school during the same period increased 51·87 per cent; and the proportion of children attending school to the total number of the children at the ages 5 to 15, increased from 57·93 per cent. to 66·78 per cent.

Ailments and  
accidents.

*Sickness, debility, and accident.*—The total number of persons at 15 years and over returned as suffering from sickness, accident, or infirmity was 2,219, or 126·45 per 10,000 living at those ages; the proportion was greatest among the males, on account of accidents being included, having been 137·03 per 10,000 of males, and 109·35 per 10,000 of females; but the sick males amounted to 99·40 and the males suffering from accident to 30·80 per 10,000, while the sick females amounted to 97·41, and those suffering from accident to 5·82 per 10,000.

The proportion of sick and infirm increased regularly and rapidly at each quinquennial period in the case of the males, while the increase was far more irregular in the case of the females; at 35 to 40, 83·08 per 10,000 of males, and

95·62 per 10,000 of females were returned as sick; at 40 to 45 the numbers were respectively 115·88 males and 105·82 females; at 45 to 50, 168·21 males and 170·18 females; at 50 to 55, 184·69 males, and 215·35 females.

The cases of debility and infirmity commenced to be numerous at the ages 55 to 60, where they amounted to 14·15 per 10,000 males, and 28·42 per 10,000 females; at 60 to 65, 45·25 per 10,000 males, and 29·78 per 10,000 females; at 65 to 70, 93·99 per 10,000 males, and 58·14 per 10,000 females; and at 70 to 75, 335·57 per 10,000 males, and 286·30 per 10,000 females.

The proportion of females at the higher ages who were suffering from sickness or infirmity was on the whole considerably less than the proportion of males at the same ages who were sick or infirm.

*Specified infirmities.*—The information with respect to the following infirmities was given without regard to age, although the cases of sickness and infirmity previously mentioned only referred to persons over 15 years of age. The number of persons at all ages returned as suffering from specified infirmities amounted to 1,034. The following are the infirmities referred to:—

Specified infirmities.

*Deaf and dumb.*—57 persons were tabulated under this head. Of these 28 were under 15 years of age, and 29 of various ages from 15 to 75. 12 of these persons were returned as having specific occupations. These were 1 female domestic, 3 bootmakers, 2 farm labourers, 1 dressmaker, 1 miner, 1 labourer (unspecified), 1 farmer, 1 bushman, and 1 carpenter.

Deaf and dumb.

*Blind.*—70 persons, viz., 42 males, and 28 females were returned as being blind. Of these 17 were under 20 years of age, 16 between 20 and 40, 16 between 40 and 50, 6 between 50 and 60, and 15 over 60.

Blind.

*Lunatics.*—597 persons were returned as lunatics—398 males and 199 females; 10 were under 20 years of age and 19 between 20 and 25. There was a larger number at the ages 35 to 40, than at any other quinquennial period, the males numbering 85, and the females 44.

Lunatics.

#### MANUFACTORIES, MACHINES, WORKS.

GENERAL SUMMARY of certain MANUFACTURES, WORKS, &c. (specified in the succeeding Table) in operation in the several Provinces of NEW ZEALAND in the Month of December 1873, with the NATURE and AMOUNT of POWER, and the NUMBER of HANDS EMPLOYED.

General Summary of Factories, Nature, Power, and Number of Hands employed.

Province.	Number of Manu- factories, Works, &c.	Power employed.							Amount of Horse Power employed.	Number of Hands employed.	
		Steam.	Water.	Steam and Water.	Wind.	Wind and Steam.	Horse.	Manual and unspecified.		Males.	Females.
Auckland	111	53	5	3	—	—	5	45	1,259	2,383	46
Taranaki	7	1	—	—	—	—	—	6	20	56	2
Wellington	53	33	3	4	—	—	10	4	462	714	16
Hawkes' Bay	30	6	2	—	—	—	2	20	81	220	—
Marlborough	23	10	1	—	—	—	3	9	210	265	1
Nelson	32	10	5	—	—	—	—	17	149	233	4
Westland	29	6	2	1	—	—	1	19	179	262	—
Canterbury	122	40	2	2	1	—	20	57	449	1,263	47
Otago	250	87	13	3	1	1	33	110	1,394	2,603	79
Totals	657	246	34	13	2	1	74	287	—	7,999	195

## MANUFACTORIES, MACHINES, WORKS.

Detailed List.

TABLE showing the NUMBER of MANUFACTORIES, WORKS, &c., of the under-mentioned description, which were in operation in the several Provinces of NEW ZEALAND in the Month of December 1873.

Manufactories, Works, &c.	No.	Manufactories, Works, &c.	No.
Agricultural Implement -	6	Furniture - - - -	6
Bacon - - - -	3	Gas Works - - - -	8
Basket and Toy making -	1	Glass Works - - - -	1
Biscuit - - - -	4	Hat and Cap - - - -	3
Block and Pump - - - -	1	Glue - - - -	2
Boiler making - - - -	2	Hearthrug and Matting -	1
Boiling down and Meat pre- serve.	10	Iron and Brass Foundries -	22
Bone Manure - - - -	3	Lime Works - - - -	14
Boot - - - -	5	Malt Kilns - - - -	19
Brick, Tile, and Pottery -	84	Mechanics, Engineers, and Mill- wrights.	10
Candle and Soap - - - -	12	Pail, Tub, and Washboard -	2
Cigar - - - -	2	Paint - - - -	1
Clothing - - - -	2	Petroleum Works - - - -	1
Coach-building - - - -	19	Printing Establishments -	67
Coffee, Chicory, Spice, and Pearl Barley.	8	Rope, Cordage, and Mat -	17
Collieries and Coal Pits -	44	Saw Mill, and Sash and Door -	162
Colonial Wine - - - -	1	Ship and Boat Building -	20
Cooperage - - - -	2	Stone Quarries (Building) -	13
Distilleries - - - -	2	Turning Wood or Ivory -	1
Fellmonger, Tanner, Currier, and Wool Scourer.	71	Varnish - - - -	1
Fish-curing and Cod Oil -	2	Woollen Cloth - - - -	2
			657

## MAORI POPULATION.

Maoris and half  
castes.

The total number of Maoris, and of half castes living as Maoris, was in 1874 estimated at 45,470, of whom 43,538 were in the North Island and 1,932 in the South and its adjacent islands.

Tribes.

The number of the principal tribes is 19; of these the Ngatikahungunu is the strongest, numbering 6,065 persons, of whom 3,262 were males, and 2,803 females. The Ngapuhi rank next in point of numbers, having a following of 5,867, viz., 3,235 males, and 2,632 females. The Waikatos are third on the list, their numbers being estimated at 4,518, viz., 2,438 males, and 2,080 females. The Ngatiporon numbered 4,024, viz., 2,234 males, and 1,790 females; and the Arawas, 3,294, viz., 1,733 males, and 1,561 females. Of the Maoris in the colony, 24,363 were stated to be males, and 20,335 to be females. The sex of 772 was not given.

Comparative  
ages of Maoris  
and English  
population.

As much difference of opinion has existed as to whether the numerical decline of the Maori race has not been, at any rate in certain districts, arrested, it may be interesting to compare, so far as they are given, the ages of the Maoris with the ages of the settled and steadily increasing population of England. The numbers and sexes of some of the Maori tribes have been imperfectly given. It is therefore necessary to deal only with those tribes for which full information as to numbers, ages, and sexes is given. This was the case in respect of the numbers belonging to 13 of the principal tribes, amounting in the whole to 31,645. Of these 6,079 were males under 15, and 5,225 females under 15. The males over 15 amounted to 11,209, and the females over 15 to 9,132. There was a total excess of males over females of 2,931, or to every 100 males there were 83.05 females. In England, in 1871, the males under 15 amounted to 37.15 per cent. of the whole male population; the Maori males, of the tribes given, under the age of 15, amounted to 35.16

Maori males and  
females under 15.  
Over 15.

Male proportion,  
England and  
Maoris.

per cent. of the whole male population of those tribes. The females of similar ages were respectively, in England 35·12 per cent. of the whole female population, and among the Maoris 36·39 per cent. If the numbers of the males and females under 15 be respectively compared, the following result is shown :—

PROPORTIONS PER CENT. to the WHOLE POPULATION.					Proportion per cent., England and Maoris.
Age.		England.	Maoris.		
Males under 15	- - -	18·09	19·21		
Females under 15	- -	18·03	16·51		

To draw any conclusions from these figures, it would be necessary to have more exact information as to the numbers of the Maoris living at the various higher age periods, but the information has only been given for the periods under and over 15.

Female percentage, England and Maoris.

Fuller information as to Maoris requisite for correct conclusions.

The existence among the Maoris of a higher proportion of females under 15 (ultimately to become wives and mothers) to the total female population than obtains in England, the numbers under 15 to the total females being respectively 36·39 per cent. among the Maoris, and 35·13 per cent. in England, might at first sight lead to the belief that the decline in the numbers of the race had been arrested, and that even an increase might be expected.

Seeming arrest of decline in numbers.

It will however be manifest that if there are causes in operation which increase the mortality of the adult Maoris without increasing the mortality of the children, the actual proportion of children to the whole population would be thereby much greater and an appearance of productiveness shown which did not really exist.

Such idea fallacious.

Do such causes exist? Does the fact of the partial adoption by the adult Maori of civilised habits and costume, and the continual reversion to the habits and costume of barbarism, with a system rendered more susceptible to external influences, especially those of a humid and changeable climate, tend to promote the spread of diseases, notably of tubercular diseases, and consequent mortality? Does the spread of drinking habits tend to shorten the life of the adult Maori? These and other similar questions have an important bearing on the subject.

Causes of increased adult mortality.

The examination of the numbers of some of the tribes points rather to the conclusion that some such causes of mortality among the adults do exist. The Ngatikahungunu show 41·91 per cent. of the males, and 41·21 per cent. of the females as being under 15 years of age. The Rarawa show 40·58 per cent. of the males, and 48·30 per cent. of the females as being under 15.

It is hardly conceivable that the women of these tribes should have been so exceedingly prolific, and that, as in the case of the Rarawa, nearly one half of the female population should have been under 15, unless a large number of adult women had died before reaching middle age, thereby increasing the proportion of younger females by reducing the proportion of the adults.

It may be noticed in connection with this subject that in 1871 the Maoris were estimated at 37,502, and in 1867 at 38,540, while in 1874 they were estimated at 45,470. The estimates formerly made were, however, from the then state of feeling in the Maori population, necessarily much more imperfect and unreliable than those recently made.

#### b. Digest of Latest Statistics.

*Population and vital statistics.*—The estimated population on the 31st December 1875 was, exclusive of the Maoris, 375,856, an increase on the estimated population of the 31st December 1874 of 33,996, or an increase at the rate of 9·94 per cent. for the 12 months. As the increase for the three quarters ending the 30th September 1876 is now known, and the increase for the remaining three months estimated with tolerable accuracy, the population on the ensuing 31st December 1876 may be estimated approximately at 397,300.

Digest of latest statistics.

These figures do not include the aboriginal natives, who numbered in 1874 45,470. As no record of their births or deaths are kept it is impossible to estimate the difference in their numbers at present. If that number be added to the rest of the population there would thus be given a total of 442,770 inhabitants on the 31st December 1876. The increase during 1874 (the aboriginal natives not being included in any of the figures herein given unless specially stated to be) was 8,726. The increase by excess of immigration over emigration was 25,270.

**Births.** *Births.*—The children born alive and registered in 1875 amounted to 14,438, or at the rate of 40·23 per 1,000 of the population. The average birth-rate in England is about 35·3 per 1,000. As in the English population the females are more numerous than the males, while in New Zealand the males are largely in excess of the females, to compare the birth-rate in the colony with the birth-rate in England, the rate should rather be estimated on a total population of which the males do not exceed the females. Deducting from the population the surplus males, the birth rate in New Zealand in 1875 would have been at the rate of 46·56 per 1,000 of equal males and females.

**Sex.** *Sex.*—Of the children born alive 7,990 were males and 6,948 females, or at the rate of 107·8 boys to 100 girls.

**Illegitimate births.** *Illegitimate Births.*—These births registered in 1875 numbered 197, or 1·36 per cent. of the births registered. This is far lower than the English rate (5·2) in 1873.

**Marriages.** *Marriages.*—The marriages in 1875 numbered 3,209, the number of persons married being at the rate of 17·88 per 1,000 of the population. This is somewhat in excess of the English rates for 1872 and 1873, which were respectively 17·5 and 17·6. The rate in New Zealand is higher than the prevailing rate in the Australian colonies. Although the average rate for 10 years in Queensland was higher in 1875 it only amounted to 17·25. The following table shows for a period of ten years the number of marriages by ministers of each denomination, and by lay registrars:—

#### MARRIAGES BY DIFFERENT RELIGIOUS BODIES.—DECENNIAL RETURN.

Marriages by different religious bodies, from 1866 to 1875.

RETURN of the NUMBER of MARRIAGES solemnized in NEW ZEALAND by Officiating Ministers of the several Religious Bodies and by Registrars, during the Decennial Period 1866 to 1875 inclusive also for the Year 1875, the number of cases in which one or both of those married were unable to sign their names in the Marriage Register.

Religious Bodies.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	Signed with Marks in 1875.			
											Men.	Women.	One.	Both.
United Church of England and Ireland	509	514	518	508	465	422	406	625	718	821	28	67	73	10
Church of Scotland	8	14	11	6	—	—	—	5	11	—	—	—	—	—
Roman Catholic Church	314	328	332	311	279	281	277	300	348	381	38	80	80	19
Free Church of Scotland	657	690	428	342	363	374	328	448	528	—	—	—	—	—
Presbyterian Church of New Zealand	—	—	—	—	—	—	—	—	—	529	13	28	29	5
Presbyterian Church of Otago and Southland	—	—	292	276	272	279	246	300	417	444	14	30	38	3
Presbyterian Congregations	2	4	6	5	—	3	1	—	—	—	—	—	—	—
Wesleyan Methodist Society	207	194	205	190	182	215	215	211	278	406	13	31	30	7
Congregational Independents	63	57	49	49	48	29	57	47	50	65	1	4	5	—
Baptists	43	52	41	33	52	40	40	44	58	68	—	—	—	—
Primitive Methodist Society	41	20	33	23	31	32	14	40	56	82	3	7	6	2
Lutheran Church	5	2	1	4	4	3	5	8	2	9	2	1	1	1
German Evangelical	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hebrew Congregations	—	4	3	3	6	—	4	6	9	8	—	—	—	—
United Methodist Free Churches	15	10	9	8	10	10	27	23	55	60	2	4	2	2
Christian Brethren	—	—	—	7	6	5	3	5	3	—	—	—	—	—
Church of Christ	—	—	—	—	—	—	—	4	4	5	—	—	—	—
No Denomination specified	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Performed by Registrars	177	164	156	165	138	170	160	211	291	336	19	45	52	6
<b>Totals</b>	<b>2,041</b>	<b>2,053</b>	<b>2,087</b>	<b>1,935</b>	<b>1,866</b>	<b>1,867</b>	<b>1,874</b>	<b>2,277</b>	<b>2,831</b>	<b>3,209</b>	<b>131</b>	<b>295</b>	<b>316</b>	<b>55</b>

In three cases in 1866, three cases in 1867, two cases in 1868, four cases in 1869, five cases in 1870, three cases in 1871, one case in 1872, one case in 1873, and two cases in 1874, the marriages were solemnized by both Protestant and Roman Catholic officiating ministers; also in 1874, a marriage by a registrar was again solemnized by an officiating minister of the Free Church of Scotland on a separate certificate.

It will be observed that of the 3,209 men who were married in 1875 only 131 or 4·08 per cent. signed the register with marks. This was a higher rate than in 1874, when it was 3·92 per cent. The number of women signing by marks in 1875 was 295 or 9·19 per cent. against 9·30 per cent. in 1874. In 1873 these rates were, respectively, men 2·94 per cent. and women 7·86. During the period a large free immigration from the United Kingdom has taken place.

*Ages of persons married.*—In 1875 of 3,209 women married, 921 were under 21 years of age, and 2,288 were 21 years and over; 1,216 married at the ages 21 to 25, and 592 at the ages 25 to 30. Of every 100 men married 2·06, and of every 100 females married 28·70, were under 21 years of age.

Ages of persons married during year 1875.

### AGES OF PERSONS MARRIED.

RETURN showing the AGES OF PERSONS MARRIED in NEW ZEALAND during the Year 1875.

Ages of Husbands.	Total Husbands.	Ages of Wives.																	Unspecified Ages.	
		Under 15.	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	Full.	Minor.
			16	17	18	19	20	21	25	30	35	40	45	50	55	60	65	70		
17 to 18	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
18 to 19	2	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—
19 to 20	10	—	1	—	1	3	—	—	1	1	—	—	—	—	—	—	—	—	—	—
20 to 21	53	—	3	2	3	9	8	8	18	2	—	—	—	—	—	—	—	—	—	—
21 to 25	767	—	1	17	40	80	85	89	394	55	4	1	—	—	—	—	—	—	—	—
25 to 30	983	—	6	18	42	94	109	87	405	184	25	11	2	—	—	—	—	—	—	—
30 to 35	646	1	1	2	14	24	46	48	258	151	70	25	4	—	—	—	—	—	—	—
35 to 40	410	—	—	1	7	5	17	24	100	138	55	44	13	3	—	—	—	—	1	1
40 to 45	174	—	—	—	—	1	4	4	29	36	43	30	15	8	2	1	—	—	1	—
45 to 50	83	—	—	—	—	—	—	1	10	16	18	12	11	3	1	—	—	—	—	—
50 to 55	36	—	—	—	—	1	—	—	—	6	8	7	7	3	4	—	—	—	—	—
55 to 60	15	—	—	—	—	—	—	—	—	2	2	1	3	2	—	4	1	—	—	—
60 to 65	8	—	—	—	—	—	—	—	—	—	1	1	2	1	3	—	—	—	—	—
65 to 70	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
70 and upwards	4	—	—	—	—	—	—	—	1	1	—	—	—	—	2	—	—	—	—	—
Unspecified, but of full age	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13	3	—
Totals	3,209	1	12	40	107	215	273	263	1,216	592	227	132	58	23	14	6	1	1	15	5

*Deaths.*—The death-rate in 1875 was exceptionally high, having amounted to 15·92 per 1,000 of the population, the highest rate for the last 10 years. The following table shows the number and proportion of births, marriages, and deaths for the last 10 years:—

Deaths, exceptionally high rate in 1875.

### PROPORTION OF BIRTHS, MARRIAGES, AND DEATHS TO THE POPULATION. DECENNIAL RETURN.

#### Births, Marriages, and Deaths.

Proportion of births, marriages, and deaths, to the population from 1866 to 1876.

Year.	Estimated Mean Population of New Zealand.	Numerical.			Proportion to every 1,000 of Population.		
		Births.	Marriages.*	Deaths.	Births.	Marriages.*	Deaths.
1866	197,360	8,466	2,038	2,540	42·89	10·32	12·86
1867	211,591	8,918	2,050	2,702	42·18	9·69	12·78
1868	222,325	9,591	2,085	2,662	42·14	9·35	11·94
1869	231,834	9,718	1,931	2,721	41·90	8·32	11·73
1870	242,824	10,277	1,851	2,703	42·32	7·62	11·13
1871	260,630	10,652	1,864	2,643	40·64	7·15	10·13
1872	273,273	10,795	1,373	3,184	39·50	6·85	11·68
1873	287,252	11,232	2,276	3,645	38·99	7·90	12·66
1874	320,687	12,644	2,828	4,101	40·05	8·81	12·97
1875	358,558	14,438	3,200	5,712	40·23	8·94	15·92

\* The number of persons married, and the number married in proportion to every 1,000 of the population, may be ascertained by doubling the numbers in these two columns.

Per-centage of children in 1875.

Of the deaths in 1875, 2,777, or 48·62 per cent., were of children under five years of age. The deaths of children under one year amounted to 12·58 to every 100 births, the corresponding proportion in 1874 having been 10·85. The mortality of infants was, in 1875, exceptionally great in the majority of the boroughs of the colony, and generally in the colony.

Sexes of deceased persons.

*Sexes of deceased persons.*—Of the deaths, 3,376 were of males, and 2,336 of females, which, upon the estimated mean number of each sex living in the year, gives a rate of mortality among the males of 16·56 per 1,000, and among the females of 15·07 per 1,000. That is, in equal numbers living 110 males died to every 100 females. This is a larger proportion of male deaths than obtained in 1874, the numbers then having been, in equal numbers living, 99·61 males to the 100 females.

Causes of death.

*Causes of Death.*—The following table gives the classification of diseases which have terminated fatally, with the per-centage of each class and order of disease to the total mortality in 1874 and 1875:—

*Class I.—Zymotic Diseases.*

	1874.	1875.
Order 1. Miasmatic diseases	26·92	26·84
„ 2. Enthetic „	·14	·28
„ 3. Dietic „	1·85	2·05
„ 4. Parasitic „	·41	·87
	<hr/> 29·32	<hr/> 30·04

*Class II.—Constitutional Diseases.*

Order 1. Diathetic diseases	2·93	2·38
„ 2. Tubercular „	9·40	9·82
	<hr/> 12·33	<hr/> 12·20

*Class III.—Local Diseases.*

Order 1. Nervous diseases	10·67	9·61
„ 2. Circulation, diseases of	4·71	4·83
„ 3. Respiratory organs, diseases of	12·28	12·87
„ 4. Digestive „	6·37	6·21
„ 5. Urinary „	·99	1·09
„ 6. Generative „	·26	·12
„ 7. Locomotive „	·22	·12
„ 8. Integumentary system „	·53	·25
	<hr/> 36·03	<hr/> 35·10

*Class IV.—Developmental Diseases.*

Order 1. Children, diseases of	4·80	4·76
„ 2. Adults „	1·47	1·21
„ 3. Old people „	1·32	1·32
„ 4. Nutrition „	5·58	6·16
	<hr/> 13·17	<hr/> 13·45

*Class V.—Violence.*

Order 1. Accident or negligence	7·31	6·86
„ 2. Homicide	·07	·26
„ 3. Suicide	·48	·51
„ 4. Execution	·02	·02
Violent deaths not classed	—	·18
	<hr/> 7·88	<hr/> 7·83

Causes of death not specified	1·27	1·38
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Notwithstanding the increased death-rate last year (the increase having amounted to 2·95 per 1,000 of the population), yet there was not any marked difference between the proportions of deaths in any particular class or order from those obtaining in 1874. The increase appears to have been general in all classes of disease. While the proportion of zymotic diseases, as a whole, was slightly increased, the proportion of deaths from miasmatic diseases was rather less. The principal fatal miasmatic diseases in 1875 were, measles (289), diphtheria (106), typhus and typhoid fever (311), and dysentery and diarrhoea (510). Measles in 1875 was epidemic in nearly all the provinces.

Causes of increased rate in 1875.

There was a large reduction in the deaths from diphtheria, the numbers in 1874 having been 187. The greatest number of deaths in 1875 from this cause occurred in Canterbury (44), Otago (24), and Auckland (20).

Diphtheria.

The deaths from typhus and typhoid fever chiefly occurred in—

Typhus, and typhoid.

Auckland	-	-	-	69
Hawkes Bay	-	-	-	29
Wellington	-	-	-	46
Canterbury	-	-	-	104
Otago	-	-	-	40

The proportion of deaths from that cause to the 1,000 of population was, in each of the above provinces, as follows:—

	1874.	1875.
Auckland	·53	·90
Hawkes Bay	1 death.	2·40
Wellington	·58	1·22
Canterbury	·86	1·39
Otago	·30	·39

Of the 510 deaths from dysentery and diarrhoea, 458 were of children under five years of age, of whom 331 were under one year.

Dysentery and diarrhoea.  
Tubercular diseases.

The deaths from tubercular diseases were in the proportion of 9·82 per cent. of the total deaths in 1875 against 9·40 in 1874. Of these the deaths from phthisis were in the proportion of 5·93 per cent. in 1875, and 6·73 in 1874. This is only an apparent, not a real, decrease, caused by the largely increased general rate of mortality. The actual number of deaths from phthisis was 339 in 1875, against 270 in 1874; the proportion to the 1,000 of population having been ·94 in 1875 and ·84 in 1874.

The number of violent deaths has increased in the same ratio as other deaths, the proportion to the total deaths being very little different from the proportion in 1874. Of these deaths 164 were from drowning, viz., 142 males and 22 females, against 92 males and 11 females in 1874. Of these deaths five males and two females committed suicide. The total number of suicides in 1875 was 29; of these, six were females.

Violent deaths.

**Hospitals.**—4,033 males and 1,130 females were admitted into the various hospitals in the colony during the year 1875; 407 males and 87 females died, and 3,596 males and 1,063 females were discharged. The total number relieved amounted to 5,724 in-door patients, including inmates, at the commencement of the year, and 9,121 out-door patients. There was provision in the hospitals for 714 males and 217 females, or a total of 931 beds. The aggregate number of cubic feet in the sleeping wards amounted to 915,305, or an average of about 983 cubic feet for every bed; the amount of space in each hospital varies considerably. In 10 hospitals the space in the sleeping wards amounted to 1,000 cubic feet and upwards for each bed, the highest being Westport, 1,562 feet; in 12 hospitals the amount of space is between 500 and 1,000 feet and in three cases the space is under 500, viz., Timaru, 379 feet; Coromandel, 475 feet; and Switzers, 491 feet.

Hospitals.

**Lunatic Asylums.**—The number of patients remaining in the various lunatic asylums at the end of the year amounted to 479 males and 251 females. Of these, 112 males and 64 females were supposed to be curable, and 367 males and 187 females supposed to be incurable; 224 males and 108 females were admitted during the year, and 143 males and 75 females discharged; 669 males and 337 females, or a total of 1,006 persons, were treated as inmates of these asylums during the year. The asylums in the aggregate afford

Lunatic asylums.

accommodation for 512 males and 273 females, or a total of 785. As the aggregate number of cubic feet in the sleeping wards amounted to 414,746, there was an average space of 528 cubic feet in the sleeping wards for each patient, or rather more than equal to a room measuring eight feet each way.

**Letters received.**—The total numbers of letters received in New Zealand during the year 1875 were—From places without the colony, 699,963, against 585,530 in 1874; and from places within the colony, 4,353,440, against 3,753,635 in 1874, making a general total of 5,053,403, against 4,339,165 in 1874, being an increase of 714,238, or 16·4 per cent.

**Letters despatched.**—The total numbers of letters despatched were—To places without the colony 642,575, against 589,706 in 1874; and to places within the colony 4,731,873, against 4,129,585 in 1874, making a general total of 5,374,448, against 4,719,291 in 1874, being an increase of 655,157 or 13·8 per cent.

**Papers received.**—The total numbers of papers received were—From places without the colony 1,250,788 against 1,144,579 in 1874; from places within the colony 2,775,669 against 2,728,089 in 1875, making a general total of 4,026,457 against 3,872,668 in 1874, an increase of 153,789.

**Newspapers despatched.**—The total numbers of newspapers despatched were—To places without the colony 514,239, against 441,731 in 1874; to places within the colony 2,270,581 against 1,992,293 in 1874; making a general total of 2,784,820, against 2,434,024 in 1874, being an increase of 350,796.

**Postal revenue.**—The total amount of postal revenue in 1875 was 122,495*l.* 18*s.* 9*d.*, against 104,361*l.* 2*s.* 11*d.* in 1874. Both these accounts include the sums that would have been chargeable on the franked correspondence if such had been paid for. The actual cash postal revenue for the year was 72,113*l.* 10*s.* 11*d.*, against a similar cash revenue of 65,581*l.* 18*s.* 10*d.* in 1874.

**Electric telegraph.**—The telegraph stations in the colony on the 31st December 1875 numbered 133, an increase of 22 on the number of stations in 1874. The number of miles of line was 3,156, against 2,632 in 1874. The number of miles of wire was 7,065, against 5,284 in 1874. The number of private telegrams was 849,919, against 724,582 in 1874, yielding a revenue of 59,678*l.* 10*s.* The Government telegrams amounted to 143,404. The aggregate number of public and private telegrams amounted to 993,323, against 844,001 in 1874, an increase of 149,022.

#### Finance, Accumulation, and Production.

**Revenue.**—The customs revenue in 1875 amounted to 1,234,967*l.*, against 1,188,948*l.* in 1874, being an increase of 46,019*l.*, or 3·87 per cent. The following figures show the comparative amounts realized by this branch of the revenue during the 10 years 1866 to 1875, inclusive:—

		£		£	
from 1866 to 1875.	1866	-	844,267	being an increase of 114,259	or 15·65 per cent.
	1867	-	843,997	„ a decrease of	270 „ 03 „
	1868	-	788,829	„ „ „	55,168 „ 6·53 „
	1869	-	823,511	„ an increase of	34,682 „ 4·39 „
	1870	-	765,930	„ a decrease of	57,581 „ 6·99 „
	1871	-	731,883	„ „ „	34,047 „ 4·44 „
	1872	-	813,279	„ an increase of	81,396 „ 11·12 „
	1873	-	965,800	„ „ „	152,521 „ 18·75 „
	1874	-	1,188,948	„ „ „	223,148 „ 23·10 „
	1875	-	1,234,967	„ „ „	46,019 „ 3·87 „

The total ordinary revenue in 1875 amounted to 2,047,234*l.*, against 1,873,448*l.* in 1874, an increase of 173,786*l.* The ordinary revenue as above given, includes ordinary provincial revenue. The territorial revenue in 1875 amounted to 688,722*l.*

The incidental receipts and reimbursements amounted to 77,972, thus making the general total of the revenue—ordinary, territorial, and incidental, 2,813,938*l.*

**Expenditure.**—The expenditure may be classed as expenditure charged on revenue, expenditure charged on loans, and expenditure of a special character charged on trust funds. It is not necessary here to deal with trust fund expenditure.

The expenditure charged on revenue is partly by the Colonial Government, partly by the Provincial Government. This class of expenditure, after deducting all transfers, Treasury bills redeemed, and bank overdrafts repaid, amounted in 1875 to the following :—

	£	s.	d.	
By the Colonial Government	-	-	-	1,712,358 18 1
Provincial Government	-	-	-	1,719,613 14 5
				<hr/> £3,431,972 12 6 <hr/>
				By Colonial Government. By Provincial Government. Total Expenditure.

Thus making the total expenditure charged on revenue amount to 3,431,972*l.* 12*s.* 6*d.* This sum does not include the same amounts twice as expenditure, such as payments out of the consolidated revenue to the provinces, and again the application of those sums by the provinces. The actual expenditure in services is only included.

The excess of expenditure over income was covered by balances in hand at the commencement of the year, and a repayment of an advance made from revenue of the previous year of the sum of 150,000*l.* to the Public Works Loan Account.

In addition to the above 45,000*l.* worth of Treasury bills (in excess of renewals), and 15,425*l.* worth of debentures were redeemed, and a provincial bank advance of 5,377*l.* 12*s.* 10*d.* repaid out of revenue.

The actual expenditure charged on loans, after deducting all transfers from one fund to another by way of account, and the redemption of debentures and advances repaid, amounted in 1875 to 3,107,867*l.* 11*s.* 10*d.*, including the amount of 95,614*l.* 3*s.* 1*d.* authorized to be expended from loans for provincial purposes.

**Debt of General and Provincial Governments.**—The total debts of the General and Provincial Governments, consisting of debentures and Treasury bills in circulation on 31st December 1875, amounted to 17,400,031*l.*, the total annual charge on which was 946,974*l.* 5*s.*, of which the sum of 832,556*l.* 5*s.* was for payment of interest, and the sum of 114,418*l.* was for payment to the sinking fund. The total accrued sinking fund on the 31st December was 1,100,119*l.* 10*s.* 6*d.*

Debts of General and Provincial Governments.

Of the above totals, the indebtedness of the General Government amounted to 13,897,185*l.*, with a total annual charge, for interest and sinking fund of 732,045*l.* 3*s.* 10*d.*; and the indebtedness of the various Provincial Governments amounted to the sum of 3,502,846*l.*, with a total annual charge for interest and sinking fund of 214,929*l.* 1*s.* 2*d.* The total debt per head of the population on the 31st December 1875, was 46*l.* 5*s.* 10*d.*, apportioned thus: colonial debt per head, 36*l.* 19*s.* 5½*d.*; provincial debt per head, 9*l.* 6*s.* 4½*d.* The total annual charge per head for interest and sinking fund, amounted to 2*l.* 10*s.* 4½*d.* against a total annual charge of 2*l.* 4*s.* 7¾*d.* per head on the 31st December 1874. As the sinking fund amounted to 2*l.* 18*s.* 6*d.* per head, the debt per head may be estimated at so much less.

#### Accumulation.

**Banks.**—The total average liabilities of the banks within the colony during 1875 amounted to 6,987,318*l.* 3*s.* 2*d.*, the total average assets to 10,987,178*l.* 14*s.*, the total capital paid up on the 1st December 1875 to 4,681,776*l.* 9*s.* 8*d.*, the total amount of last dividends 3,171,404*l.* 13*s.* 3*d.*, and the total amount of reserved profit at the time of declaring such dividends, 1,549,494*l.* 9*s.* 5*d.*

Banks.

**Post Office Savings Banks.**—At the close of the year 1875 there were 119 post office savings banks, being an increase of 16 compared with 1874. The total deposits (including addition to open accounts) amounted to 657,653*l.* 4*s.* The average amount of deposit to the credit of each account was 29*l.* 17*s.* 9*d.* against 35*l.* 9*s.* in 1874.

Post Office Savings Banks.

**Other Savings Banks.**

*Other Savings Banks.*—In savings banks, other than those of the post office, the deposits in 1875 by Europeans amounted to 99,916*l.* 17*s.* 2*d.*, and by Maoris to 117*l.* The total amount to the credit of depositors in these banks in 1875 was, Europeans 169,789*l.* 10*s.* 8*d.*, Maoris 241*l.* 3*s.* 8*d.* The total accumulated deposits in both classes of savings banks thus reached the amount of 897,326*l.* 2*s.*

**Money Orders.**

*Money Orders.*—The total number of money orders issued in New Zealand in 1875, was 73,027, representing a total of 293,481*l.* 10*s.* 9*d.* The number of money orders drawn on the colony in 1875 was 52,575, representing an aggregate amount of 187,284*l.* 14*s.* 1*d.* in 1874.

**Constabulary and Volunteers.****Armed Constabulary.**

*Armed Constabulary.*—The total strength of this force on the 31st December 1875 was 728, distributed over 65 posts in the North Island. There were 43 commissioned officers, and 595 rank and file.

**Volunteers.**

*Volunteers.*—The various branches of the volunteer force gave a total strength of 6,080 officers and men, belonging to 127 corps.

**Representation.****Electors.**

*Electors.*—The number of persons registered as electors amounted to 58,744, equal to 28 per cent. of the mean male population for the year 1875.

**SECTION H.—TRADE, AGRICULTURE, PRODUCTIONS, &c.****Trade Imports and Exports.****Value of import and export trade in 1875.**

The total value of the import and export trade of New Zealand in 1875 amounted to 13,857,799*l.*, of which the imports amounted to 8,029,172*l.*, and the exports to 5,828,627*l.* employing a total of shipping *inwards* of 926 vessels of 416,726 tonnage. As the first body of settlers only arrived in 1839 this trade is the growth of 35 years.

**Table of imports and exports from 1866 to 1875.**

The following table gives the total value of imports and exports for each of the last 10 years :—

—				Imports.	Exports.	Total Trade.
				£	£	£
1866	-	-	-	5,894,863	4,520,074	10,414,937
1867	-	-	-	5,344,607	4,644,678	9,989,285
1868	-	-	-	4,985,748	4,429,198	9,414,946
1869	-	-	-	4,976,126	4,224,860	9,200,986
1870	-	-	-	4,639,015	4,822,756	9,461,771
1871	-	-	-	4,078,193	5,282,084	9,360,277
1872	-	-	-	5,142,951	5,190,665	10,433,616
1873	-	-	-	6,464,687	5,610,371	12,075,058
1874	-	-	-	8,121,812	5,251,269	13,373,081
1875	-	-	-	8,029,172	5,828,627	13,857,799

**Growth of Trade.****Rapid growth as compared with previous decade.**

A comparison with the trade in the previous 10 years shows a much more rapid growth in that period. The trade in each of the years 1856 and 1865 was as follows :—

—				Imports.	Exports.	Total Trade.
				£	£	£
1856	-	-	-	710,868	318,433	1,029,301
1865	-	-	-	5,594,977	3,713,213	9,308,195

Thus in the decade 1856-1865 the trade increased by 8,278,894*l.* or 804 per cent., but in the decade 1866-75 the trade only increased by 3,442,862*l.* or 33 per cent. Decade 1856-1865.  
Decade 1866-1875.

The large growth of trade in the years 1856-65, is attributable to the discovery during that period of the gold fields of Otago, and the large influx of population that took place in consequence.

A mining population is generally such as to materially affect the amount of trade by the production of a larger and valuable export, as well as by their generally lavish habits of expenditure.

The diminished yields in the alluvial gold fields similarly tended to materially retard and even diminish the growth of trade during the earlier years of the decade 1866-75, for while the export of wool was steadily increasing the gold export was steadily decreasing, the last export having falling from 2,897,412*l.* in 1866 to 1,407,770*l.* in 1875: The increased trade in the last four years of the decade has no doubt been caused by the operation of the immigration and public works policy, not only by the introduction of a consuming population, the distribution of larger sums of money on account of various public works, and the consequent largely increased spending power in the labouring classes, caused by the higher rates of wages, but also by the values of the materials imported by the Government for the extension of public works. The imports of bridge and telegraph materials and railway plant, &c. amounted to 796,626*l.* in 1874, and to 487,079*l.* in 1875. Diminished  
yields in alluvial  
gold fields.  
Increase in ex-  
port of wool.

#### *Trade with different Countries.*

Of the total trade in 1875 the bulk, amounting to 9,331,370*l.*, was with the United Kingdom, the exports therefrom having amounted to 5,103,610*l.* and the exports thereto to 4,227,760*l.* The total trade with the Australian colonies amounted to 3,719,353*l.* The trade with the United States amounted to 306,728*l.*; that with China (including Hong Kong) to 222,650*l.*, and that with the Pacific islands to 150,024*l.* With United  
Kingdom.  
With Australian  
colonies.  
With United  
States.  
With China.  
With Pacific  
Islands.

The following table exhibits the value of the imports from and exports to different countries in 1875:— Table of coun-  
tries, imports and  
exports, there-  
from and thereto.

#### IMPORTS AND EXPORTS FROM AND TO DIFFERENT COUNTRIES.

RETURN of the VALUE of the IMPORTS and EXPORTS of the COLONY of NEW ZEALAND, from and to each under-mentioned COUNTRY, COLONY, or PORT, during the YEAR 1875.

Country, Colony, or Port.	Imports therefrom.	Exports thereto.
	£	£
United Kingdom - - -	5,103,610	4,227,760
<i>Australia:</i>		
New South Wales - - -	549,141	225,105
Victoria - - - - -	1,578,070	*1,124,657
Queensland - - - - -	10,934	2,404
South Australia - - -	50,871	8,216
Western Australia - -	18,129	—
Tasmania - - - - -	143,843	2,783
<i>Africa (British Possessions):</i>		
Mauritius - - - - -	108,205	—
<i>India. (British Possessions):</i>		
Madras - - - - -	—	—
<i>China (British Possessions):</i>		
Hong Kong - - - - -	7,732	20,530

Country, Colony, or Port.	Imports therefrom.	Exports thereto.
<i>Islands in the Pacific :</i>	£	£
Sandwich Islands - - - -	5,514	2,686
Navigators " - - - -	4,865	5,320
Fiji " - - - -	19,467	32,169
Society " - - - -	3,984	4,839
New Caledonia - - - -	522	8,909
Tonga Islands - - - -	7,772	16,396
Cook " - - - -	7,900	9,271
Friendly " - - - -	242	5,826
Penrhyn " - - - -	423	146
Henry " - - - -	6,853	1,493
Savage " - - - -	414	1,606
Flint " - - - -	360	—
Maldon - - - -	—	6
Norfolk - - - -	414	2,585
<i>British America :</i>		
British Columbia - - - -	12,467	—
Norway - - - -	320	—
Germany - - - -	3,594	—
France - - - -	471	—
China - - - -	150,000	14,388
<i>United States of America :</i>		
On the Atlantic - - - -	187,333	91,608
On the Pacific - - - -	26,159	1,628
Peru - - - -	6,000	—
Guiana - - - -	—	16,030
Southern Whale Fishery - - - -	8,511	2,264
Total - - - -	8,029,172	5,828,627

\* This includes gold to the value of 802,617l.

List of articles,  
total quantity,  
and value.

The following table shows the total quantity and value of the principal articles (the produce of the colony) exported in 1875:—

Articles.	Quantity.	Value.
		£
Wool - - - -	54,401,540 lbs.	3,398,155
Tallow - - - -	1,811 cwts.	55,765
Hides - - - -	33,261 number	30,818
Sheepskins - - - -	237,504 "	36,629
Leather - - - -	2,295 cwts.	15,971
Gold - - - -	355,322 ounces	1,407,770
Silver - - - -	29,085 "	7,560
Coal - - - -	3,885 tons	3,129
Flour - - - -	636 "	7,700
Bran and Sharps - - - -	121 "	679
Wheat - - - -	548,095 bushels	115,093
Barley - - - -	91,622 "	20,546
Malt - - - -	6,885 "	2,510
Oats - - - -	630,325 "	93,268
Oatmeal - - - -	7,891 tons	6,652
Potatoes - - - -	415 "	2,281
Butter - - - -	104 cwts.	660
Cheese - - - -	442 "	1,862
Bacon and Hams - - - -	539 "	2,792
Salt Beef and Pork - - - -	1,082 "	1,717
Preserved meats - - - -	2,844 packages	7,180
Kauri gum - - - -	2,230 tons	198,523
Phormium, (New Zealand hemp) - - - -	639 "	11,742
Coriage - - - -	544 cwts.	1,261
Timber, sawn and hewn - - - -	5,225,627 feet	26,914
" logs, spars, lumber - - - -	1,791 number	12,945

The imports may be stated in general terms as consisting of such articles of necessity and luxury, except the agricultural or pastoral products of the colony, as are generally required by a mixed population of Englishmen of the 19th century. The presence of a considerable aboriginal population has not given any special development to any particular branch of trade, as when mixing with the settlers, the Maoris have generally required such articles as might be in use among Englishmen of the more prosperous labouring classes. While many manufactures have been established in the colony, their growth has not been sufficient to enable the imports of such articles as are locally manufactured to be dispensed with.

#### *Pastoral Pursuits.*

The mildness of the winter season, which does not require that any special provision for the keep of stock during that period should be made, and the general suitability of the country for grazing purposes, and the growth of a superior class of wool, caused the attention of the early settlers to be much given to pastoral pursuits; grass lands were looked up as sheep or cattle runs. The success attending the pursuit enabled the runholders to a large extent to purchase the freehold of their runs, or the best portions of them; and by improvements in fencing and sowing with English grasses, which thrive remarkably well in the colony, the bearing capabilities of the land were increased many fold. While for the North Island there are considerable tracts of grazing ground with natural herbage, a large extent of the country consists of hill land of varying quality covered with forest or bush, as it is called in the colony.

This land, after the bush has been cut down and set fire to, if grass seed be sown upon the ashes, is converted in a few weeks into good grazing land. Much has already been reclaimed from the bush, and supports large flocks and herds, and the same system will doubtless be extensively followed, as a large portion of country that would be so used, is not available for agricultural pursuits. In the Middle Island the bush is chiefly confined to the western slopes of the dividing range, the open hills, plains, and downs to the east of the range being available for grazing purposes. The extent to which pastoral pursuits have been followed may be estimated by the quantity of stock in the colony in 1874 (when the census was last taken). The numbers of the undermentioned kinds were as follows:—

Horses	-	-	-	-	99,859
Cattle	-	-	-	-	494,917
Sheep	-	-	-	-	11,704,853

These numbers do not include the animals in the possession of aboriginal natives, no estimate of which can be given; while, however, possessing a considerable number of horses, they own but small numbers of sheep and cattle. The export of wool has grown, since the first settlement of the colony in 1839, to an export in 1875 of 54,401,540 lbs, estimated in value at 1,354,152*l*. In ten years the increase in their quantity has been at the rate of 138 per cent.

While much of the country is only suited for sheep, a considerable portion is well adapted for the grazing of cattle. Much attention has been paid to, and capital expended on the improvement of the various kinds of domestic animals; and some of the sheep and cattle fattened on grasses only may well bear comparison with the animals fattened on artificial food for the English markets.

The horses in the colony vary much in quality, for some years they realized such low prices that but little attention was paid to the breeding of good saddle horses, and as the Maoris possess large numbers of mares (not included in the census numbers), and bred from them without much regard to the improvement of stock, there has been a large increase in the number of small weedy animals. Where care has been taken, excellent results have been obtained. As both cart horses and thorough breds of the best strains of blood have been imported, first class animals of either sort are obtainable.

#### *Agriculture.*

From various causes agriculture has only been pursued on an extensive scale in the provinces of Canterbury and Otago, both in the Middle Island. Out of 286,712 acres under grain crop in February 1876, 146,842 acres were in the province of Canterbury, and 112,184 in the province of Otago, having only 27,686 acres under grain crops in the rest of the colony.

Average yield of wheat per acre.

The average yield of wheat per acre in February 1876 was estimated in Otago at 36½ bushels and in Canterbury at 30½ bushels. In the North Island the averages range from 12½ bushels in Hawke's Bay to 19½ bushels in Auckland.

Yield of oats and barley.

The yield of oats for the colony was estimated at 35 bushels to one acre, and of barley at 29½ bushels.

Number of acres and produce in 1876.

The following were the number of acres and the estimated produce of each kind of grain crop in February 1876 :—

	Acres.	Produce.
Wheat - - -	90,804	2,863,619 bushels.
Oats - - -	168,252	6,357,431 "
Barley - - -	27,656	993,219 "

Under potatoes and average yield.

There were 14,655 acres under potatoes at that time with an average yield of 4½ tons per acre.

#### *Productions, Animal and Vegetable.*

No indigenous animals.

Before the advent of the Europeans there were not any animals, either domestic or wild, to graze on the natural herbage of the country, or to act as food for the natives. Pigs were first introduced by Captain Cook.

Animals limited to those introduced by Europeans.

The animal productions are, therefore, confined to the domestic animals introduced by the Europeans. The following table shows the number of the principal kinds in each province at the time the census was taken, the numbers belonging to the Maoris not being included :—

Numbers.

—	Horses.	Cattle.	Sheep.	Pigs.
Auckland - - -	14,555	105,595	340,241	32,439
Taranaki - - -	2,512	17,621	51,321	3,598
Hawkes Bay - - -	5,362	22,812	1,184,887	2,571
Wellington - - -	18,402	84,852	1,116,965	15,479
Nelson - - -	4,749	25,798	591,384	7,291
Marlborough - - -	3,160	9,758	784,139	4,034
Canterbury - - -	23,757	86,752	3,325,630	37,181
Otago - - -	30,840	136,921	4,326,988	20,253
Westland - - -	924	4,509	3,808	895
Chatham Island - - -	598	804	29,990	180
Total - - -	99,859	494,917	11,704,853	123,921

Supply in excess of demand.

The supply of animal food is thus far in excess of the requirements of the population, and endeavours have been made to utilize the excess by boiling down for tallow and by preserving the meat for the English markets.

Exports in 1875.

The exports of the undermentioned articles in 1875 were as follows :—

Flour - - -	636 tons.
Bran and sharps - - -	131 "
Wheat - - -	548,095 bushels.
Barley - - -	91,622 "
Malt - - -	6,885 "
Oats - - -	630,325 "
Oatmeal - - -	7,891 tons.
Potatoes - - -	415 "

A large surplus of such produce in excess of the requirements of the population would be available for the supply of military or naval forces.

#### *Transport.*

Coastal traffic a necessity.

The configuration of the colony and the difficulties of traversing the country without roads has caused a considerable coastal traffic to be developed. In December 1875 there were 428 sailing vessels of 34,759 tonnage, and 74 steam vessels of 7,266 tonnage on the New Zealand Register.

Steam traffic.

There is now a regular steam traffic between all the principal ports in Cook's Straits, leaving almost daily either for the north or south. The inland means of transport are being rapidly developed. Metalled roads are

being extended throughout the country. In the North Island coaches now ply between Wellington and Taranaki, Wellington and Napier, and Napier and Auckland.

District roads are undertaken by the road boards of the colony. The total number of these boards in the North Island in 1875 amounted to 200; they expended in that year the sum of 51,529*l.* on public works, chiefly on the formation and repairs of roads, bridges, &c. District roads.

Large drays, capable of holding three or more tons, drawn by several horses, are in use for conveying timber and heavy goods to and from the chief towns. In the mountainous portions of the northern and eastern parts of the Middle Island the difficulties of travel are chiefly on account of the broken character of the country, for these hills being bare of timber, the impediments afforded by the forests of the North Island do not exist.

Facility of transport is not attained in the Middle Island until the province of Canterbury is reached, where, if the rivers can be crossed, a cart can travel with ease from one end to another of the plains. There does not seem much prospect of an immediate direct road or railroad communication between Cook's Straits and the Canterbury Plains (although traffic on horseback is possible), but roads and railways are being rapidly extended through the length and breadth of the province, the main line of railway being extended south towards the province of Otago, and thence being in progress through Dunedin to the extreme south at Invercargil, with branches into the interior.

Excellent metalled roads have been made through the provincial portions of the province of Otago, but the rivers cannot be regarded in any way as aids to transport or communication.

Since the organization of the Public Works Department in 1870, for works in which more than one province is concerned, there have been 1,833 miles of roads constructed, or in progress, in the North Island, and 271 miles in the Middle Island, a large proportion being good traversable dray roads, the cost up to 30th June 1876 being respectively 491,636*l.* 5*s.* and 194,721*l.* 11*s.* 11*d.* Out of these totals 8,964*l.* 2*s.* were expended on roads in native districts, many thousand of good and substantial roads had been constructed by the various Provincial Governments previous to these works.

The construction of railways has been vigorously proceeded with. The following tables show their length and cost:— Construction of railways.

## RAILWAYS.—LENGTHS.

Lengths.

—	North Island.	Middle Island.	Total.
	miles. chns.	miles. chns.	miles. chns.
Open for Traffic - - -	145 2	404 71	549 73
Under construction - - -	183 6	199 39	382 45
Not yet begun - - -	63 40	34 10	97 50
Total length - - -	391 48	631 40	1,030 8

## Cost.

Cost.

—	North Island.	Middle Island.	Total.
	£ s. d.	£ s. d.	£ s. d.
Expenditure from 1870 to 30th June 1876.	1,780,955 18 7	3,409,538 16 8	5,184,494 15 8
Liabilities on 30th June 1876 -	408,211 15 0	575,042 4 7	983,253 19 7
	2,189,167 13 7	3,978,581 1 3	6,167,748 14 10
General Expenses.			
Material - - - -	—	—	29,881 15 6
Unapportionable - - -	—	—	641 9 7
Total cost - - -	—	—	6,198,271 19 11

## Details of cost.

## DETAILS OF COST.

	North Island.			Middle Island.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
Land and expenses - -	51,350	3	5	126,048	15	8	177,398	19	1
Preliminary survey - - -	50,212	18	10	54,251	7	11	104,464	6	9
Construction - - -	1,323,251	16	5	2,550,823	5	5	3,874,075	1	10
Rolling stock - - -	158,511	12	9	276,224	9	6	434,736	2	3
Workshops, &c. - - -	132,771	11	4	293,535	1	3	426,306	12	7
Engineering and offices - -	57,577	10	9	92,888	3	4	149,965	14	1
Incidental - - -	7,280	5	1	10,267	13	7	17,547	18	8
Total Expenditure - -	1,780,955	18	7	3,403,538	16	8	5,184,494	15	3

## Worked by Government.

There are eight railways now worked by Government, with the following results for the past year:—

One year ending 30 June 1876—Receipts - -	£55,776	11	4
„ „ „ Expenditure - -	44,713	7	8
	£11,063	3	8

## Average receipts per mile.

The average receipts per mile are thus 101*l.* 8*s.* There is at present one mile of railway to every 595 of the population, and when the whole of the lines under construction are completed, the proportion will be one to every 365.

## Expenditure and liability of Public Works Department.

## TOTAL EXPENDITURE AND LIABILITIES OF PUBLIC WORKS DEPARTMENT.

	Total Expenditure to 30 June 1876.			Liabilities on 30 June 1876, extending over a period of years.			Total Expenditure and Liabilities.		
	£	s.	d.	£	s.	d.	£	s.	d.
Roads North Island - -	491,636	5	0	9,918	2	8	501,554	7	8
„ South Island - -	194,721	11	11	4,158	9	10	198,880	1	9
Railways bridges, rolling stock -	5,215,018	0	4	983,253	19	7	6,198,271	19	11
Water supply on goldfields -	280,919	16	1	81,868	6	11	362,288	3	0
Advance, Thames Deep Sinking Association.	45,908	0	0	4,092	0	0	50,000	0	0
Coal exploration and mine development.	8,940	10	6	1,070	12	1	10,000	2	7
Telegraph extension - -	228,284	10	5	—			228,284	10	5
Graymouth Protection works -	4,000	0	0	—			4,000	0	0
Payments to Provinces and Road Boards.	150,000	0	0	—			150,000	0	0
Departmental - - -	82,602	7	3	1,640	15	2	84,243	2	5
Refunds of stamp Revenue -	377	7	0	—			377	7	0
Refunds, interest on deposits -	88	4	4	—			88	4	4
Unauthorised - - -	530	11	4	—			530	11	4
Total - - -	6,703,027	4	2	1,085,502	6	3	7,788,529	10	5

## Price of Labour.

## Demand for labour and rates of wages.

The great demand for labour, in consequence of the progress of public works, has caused a considerable rise in wages. The prices of some kinds of

labour vary in different portions of the colony. The following table represents the extremes of certain wages :—

With board, agricultural labourers,	15s. to 25s. per week.
Without board                    "	5s. to 9s. per day.
With board, shepherds,	45 <i>l.</i> to 80 <i>l.</i> per annum.
Without board, masons,	8s. to 16s per day.
"       carpenters,	8s. to 14s.       "
"       smiths,	8s. to 14s.       "
With board, female domestics servants,	8s. to 16s. per week.
"       needlewomen,	15s. to 25s.       "
Without board, general labourers,	5s. to 9s. per day.
With board, seamen,	4 <i>l.</i> 15s. to 8 <i>l.</i> per month.

## V.—GEOLOGY AND MINING.

### a. Geological Formations.

#### COAL.

Coal mines are being worked in the provinces of Auckland, Nelson, Canterbury, Otago, including Southland. Coal mines.

The different varieties of coal may be classed as follows :—

Class I.—*Hydrous*, containing an excess of combined water.

- a. Lignite.
- b. Brown coal.
- c. Pitch coal.

Class II.—*Anhydrous*, containing very little combined water.

- a. Glance coal.
- b. Semi-bituminous coal.
- c. Bituminous coal.

I. Hydrous, containing 10 to 20 per cent. of permanent water.

*Hydrous.*

(a.) *Lignite*, shows distinctly woody structure laminated, very absorbent of water.

(b.) *Brown coal* rarely shows vegetable structure, fracture irregular, conchoidal, colour, dark brown, lustre feeble, cracks readily on exposure to the atmosphere, losing 5 to 10 per cent. of water, which is not reabsorbed, burns slowly, contains resin in large masses.

(c.) *Pitch coal*, structure compact, fracture smooth, conchoidal, jointed in large angular pieces, colour brown or black, lustre waxy, does not desiccate on exposure nor is it absorbent of water, burns freely, and contains resin disseminated throughout its mass.

II. *Anhydrous coal*, containing less than 6 per cent. of water.

*Anhydrous.*

(a.) *Glance coal*.—Non-caking, massive, compact or friable, fracture cuboidal, splintery, lustre metallic, structure laminated, colour black, does not form a caking coal, but slightly adheres. This variety is brown coal altered by igneous rocks, and presents every intermediate stage from brown coal to anthracite.

(b.) *Semi-bituminous coal*.—Compact, with laminae of bright and dull coal alternately, fracture irregular, lustre moderate, cakes moderately, or is non-caking.

(c.) *Bituminous coal*.—Much jointed, homogeneous, tender and friable, lustre pitch-like, glistening, often iridescent, colour black with a purple hue; powder brownish, cakes strongly, the best varieties forming a vitreous coke, with brilliant metallic lustre.

#### General Description.

Class II.—*The anhydrous* kinds of coal prove to be quite equal to any imported, experiments having been undertaken in 1865 for ascertaining their value for steam vessels. Both these and the hydrous coals occur at the base of a great marine formation, underlying limestone, clays, and sandstone of cretaceous and tertiary age, which have a thickness of several thousand feet, Where found.  
Anhydrous coal.

the coal seams occurring whenever the above formation is in contact with the older rock. The anhydrous kinds are more limited, and appear to be produced by local disturbance of the strata, and in some cases are evidently due to the intrusion of volcanic rocks.

**Bituminous coal.**

*Bituminous coal* is worked chiefly in Nelson Province. At Mount Rochfort or Buller mines the seams are on a high plateau and are 10 to 40 feet thick, and from 900 to 3,000 feet above sea level; accurate surveys of this coal field show it to contain 140,000,000 tons of bituminous coal of the best quality and easily accessible; a railway 19 miles in length is in course of construction. At the Brunner coal mine on the Grey River, Nelson, the working place of the seam is 18 feet, and it has been proved to extend one-third of a mile on the strike without disturbance, and to be available for working in an area of 30 acres, the estimated amount of coal being 4,000,000 tons in this basin alone, most of which can be worked above the water level. A second mine is being opened on the south side of the river, which, with a 370 feet shaft, will command 300,000 tons.

Coal fields in Nelson have also yielded excellent coal. At Tuangahua, Murray Creek, an 18 feet seam of bituminous coal is worked, associated with quartz grits. At Pakawan, and in the same formation at Collingwood, thin seams of hard bright bituminous coal have been worked from the sandstones of the cretaceous period. The area of the coal field is about 30 square miles and the facilities of access and shipping, and the abundance of iron ore and limestone will probably make this an important mining district. The chief coal mine has been opened by a tunnel 700 feet in length piercing the mountain at 600 feet above the flats along the Arorere River, the coal being brought down by a self-acting incline.

**Glance coal.**

*Glance coal* has been worked since 1865 in Auckland at the Kawa Kawa mine, Bay of Islands, from a seam 13 feet thick in green sand, it contains much sulphur. This coal is also worked at Walton's mine, Wangarei Harbour, in a five feet seam, it contains sulphur and much ash. A better kind is worked in Canterbury in the Malvern Hill district, where there are extensive but detached seams from two to three feet thick in micaceous and argillaceous shales.

Class I.—*The hydrous coals* occur on the eastern coast chiefly.

**Pitch coal.**

*Pitch coal* has been worked since 1867 at West Wanganui in Nelson; and in Otago at Shag Point, 40 miles north of Dunedin, it has been worked since 1862 together with brown coal.

**Brown coal.**

*Brown coal* is worked in Auckland on the Waikato River, and in the Cluttra and Tokomairiro district: at the latter mine the seams are from five to 20 feet thick. The area of this coal field is about 6,000 acres, and the quantity of coal has been estimated, from surveys to be 140 million tons, nearly the whole of which would be available without sinking. In Southland at Preservation Inlet thick seams are worked on the mainland south of Coal Island. In Otago thick seams of brown coal in grits and clay shale have been worked since 1861 at Green Island and Saddle Hill.

**Lignites.**

*The Lignites* occur in the interior of Otago, and at other places in superficial deposits of limited extent, and have been used chiefly by diggers.

The following is the description of the exhibits that were shown in this class:—

1.—*Parapara Iron and Coal Company, Nelson.*

**Coal exhibits and description.**

*b. Coal from the Arorere River.* Block taken from a 3 feet seam, a fair specimen of the general quality of the field. The coal occurs in a rugged mountain range on the north bank of the Arorere River, and is tapped by a drift or tunnel on the side of the hill between 800 and 900 feet above sea level. By actual survey the field has proved of considerable extent, and in the drift alluded to above five seams have been cut, varying in thickness from 18 inches to 3 feet, out of which 6 feet of workable coal is found. It is unsurpassed in the colonies for gas purposes, is an excellent household coal, and very superior for steam use.

3.—*Nelson Committee, Nelson.*Coal exhibits  
and description.

b. Block of Coal from Coalbrook Dale, Mount Rochfort, Nelson, two seams of 8 feet and 18 inches respectively, at an elevation of 2,200 feet above sea level. Estimated area of field 12 square miles.

6.—*Taranaki Committee.*

Lignite, shows distinctly woody structure, laminated, very absorbent of water. Specimen from Urenai, North Taranaki.

7.—*Colonial Museums, Wellington.*

b. Specimens exhibiting the classification of New Zealand coals.

*Anhydrous Coals.*

A. Bituminous coals (caking). Specimens from Brunner Mine, Nelson, also of vitreous coke, with brilliant metallic lustre, made from it. Average evaporative power of several samples,  $7\frac{1}{2}$  lbs of boiling water converted into steam for each pound of coal; occurs with grits and conglomerates of Upper Neozoic age, corresponding to the horizon of the Gault or Upper Greensand. In the Buller, Grey, and Collingwood coal fields on the West Coast of Nelson, the seams are from 2 to 40 feet in thickness.

B. *Semi-bituminous coal*.—Specimens from Pakawan, Nelson, showing laminae of bright and dull coal alternately. Occurs in thin irregular seams in sandstone of Upper Neozoic age (Jurassic and Lower Cretaceous), Kawa Kawa and Wangarei, Auckland; Pakawan, Nelson; Mount Hamilton, and Waikawa, Otago; rarely cakes strongly; evaporative power commonly  $6\frac{1}{2}$  lbs.

C. *Glance coal*.—Specimens from Hill's Drive, Selwyn, Canterbury. This coal does not form a caking coke, but slightly adheres, and is a variety of brown coal, altered by faulting or by igneous rocks, and presenting every intermediate stage from brown coal to an anthracite. Occurring at Preservation Inlet and Malvern Hills, of Lower Cretaceous age, in extensive but detached seams from 2 to 3 feet thick in micaceous and argillaceous shales.

*Hydrous Coals.*

A. *Pitch coal*.—Specimens from Upper Buller, Nelson (contains resin disseminated throughout its mass); Waikato and Wangaroa, Auckland; West Wanganui, Nelson; Shag Point, Otago; Morey Creek, Southland (Upper Cretaceous period). Evaporative power 4·2 lbs.

B. *Brown coal*.—Specimens from Kaitangata, Otago. Shows no vegetable structure, has lost 5 to 10 per cent. of water since first extracted, contains resin like Kauri gum in large masses; occurs generally throughout the islands (Upper Cretaceous and Greensand age). Evaporative power 4·2 to 5·6 lbs. Saddle Hill, Otago, evaporative power 5 lbs.

8. *Kennedy Brothers, Nelson.*

Block of coal from the Brunner Mine, situated on the Grey River, Nelson, seven miles from the north of Greymouth. The seam now being worked is of a uniform thickness of 16 feet, all pure clean coal, and has been worked on a small scale during the past twelve years. The output for the year ending July 1875 was 20,000 tons. A railway is being constructed by Government to connect the mine with the port, and harbour improvements are in progress, whereby a larger class of vessels than at present will be enabled to enter. The Company now produce 2,000 tons per week. Present price free on board at Greymouth is 15s. per ton. The small quantity of this coal hitherto obtainable in New Zealand and Australian markets has been eagerly bought up for gas works and iron foundries, who generally pay for it from 10 to 20 per cent. more than for any other coal. Engineers of local steamers esteem it 20 per cent. better than the best New South Wales coal for steam purposes.

Coke made from No. 2. Value 3l. per ton.

9. *Albion Coal Company, Nelson.*

Block of coal from Ugakawan. Seam 10 feet thick, ascends from the sea level to 1,400 in Mt. Frederic range 20 miles north of Westport, with which place the mine is connected by railway.

10. *Reid, Alexander W., Canterbury.*

Altered brown coal from Kowai pass. 3 feet seam. Area of field 108 acres. Value at pits mouth 11. The pit is 6 miles from a railway, and 50 miles from port of shipment.

11. *Oakden, J. J., Canterbury.*

Anthracite coal from Lake Coleridge, Canterbury. Two seams of 5 feet each. Supposed extent of field 100 acres. Contains 90 per cent. of carbon. Pit is distant 28 miles from a railway, and 70 miles from port of shipment.

12. *Rowley, Wilson, & Co., Otago.*

Block of coal from Shag Point, Palmerston, Otago. Value per ton at pit's mouth 12s.

## GOLD.

Gold. First discovery 1840. First practical working 1852. Gold was discovered in 1840, less than three years from the foundation of the colony, but it was not practically worked until 1852, when the mines at Coromandel first attracted attention to the district of Cape Cosville peninsula, which at the present time forms the chief seat of true mining operations in New Zealand. The yield from those mines has up to the present time been small, when compared with the quantity of alluvial gold obtained in the South Island, subsequent to 1861, at which date the gold fields of Otago became prominently known. The principal mines are in Coromandel and in the Thames districts, about 30 miles apart.

Lodes. At Coromandel the lodes have been "proved" to a depth of over 300 feet from the surface, but the best mines at the Thames have as yet been principally confined to the decomposed and comparatively superficial work. Veins have been discovered and gold obtained at all levels on the ranges, from the sea level to an altitude of 2,000 feet. The quantity of gold that has been obtained from some of these quartz reefs is very great; and for considerable distances the quartz has yielded very uniformly at the rate of 600 ozs. to the ton, such reefs are, however, very exceptional.

Alluvial. Alluvial gold is chiefly found in the South Island in the provinces of Otago, Westland, and Nelson, in which districts mining operations are carried on over an area of almost 20,000 sq. miles.

Auriferous sand, three kinds. First. The auriferous sand, or gold drift as it is usually termed, is of three distinct kinds. First, that which is found in the beds of rivers, and which is worked by small parties of miners, as the process requires no large expenditure of capital to effect the separation of the gold.

Second. Secondly, immensely thick deposits of gravel of more ancient date occupy the wider valleys and the flat country, from which the gold can only be obtained by means of considerable expenditure and large engineering works for the purpose of bringing a supply of water for undermining and working the auriferous deposits. This description of mining is of a more permanent character than the former, and provision has been made by the Colonial Government for assisting the miners by the construction of water races, which will supply the means of profitable employment to a much larger number of persons than at present gain a livelihood by this description of mining.

Third. Thirdly, along the sea coast, the continued wash of the waves produces a shifting action on the sands which are brought down by the rivers and drifted along the shore, thus producing fine deposits of gold, which by aid of simple mechanical contrivances afford employment to a large number of diggers, who can labour without incurring the hardships and privations which attend the occupation of the miners in the more inland districts.

Collingwood and Hokitika. Alluvial diggings at Collingwood were discovered in 1858, and in 1864 the great goldfields near Hokitika attracted the majority of the mining population of New Zealand. In Otago the gold drifts rest on the denuded surface of their parent rocks. The auriferous gravels in the western district as a general rule rest on the surface of recent tertiary rocks of marine origin. They thus have a general distribution parallel to whatever was the western shore of the island at the time of their deposit.

Otago. The richest Westland alluvial diggings usually occur in very inaccessible places for a water supply. The streams having cut their channels much below the surface of the country, so that an organized system of irrigation is necessary to obtain the required amount of water for the gold washing.

## Yield of Gold in New Zealand up to 31st December 1875.

Yield up to 31st  
December 1875.

	Quantity. ozs.	Value. £
South Island (chiefly obtained from the metamorphic rocks, by alluvial washing) -	6,960,129	27,432,819
North Island (This gold is obtained by lode-mining in igneous rocks belonging to the Neozoic epoch) -	995,166	3,551,967
<b>Total Yield</b> -	<b>7,955,295</b>	<b>30,984,786</b>

*Metallurgical Products.*15. *New Zealand Commissioners.*

Specimens of alluvial gold and gold-bearing quartz from Auckland, West-land, and Otago, collected by the Bank of New Zealand. Gold: specimens, exhibits, and descriptions.

## LIST OF GOLD SPECIMENS collected for the NEW ZEALAND COMMISSIONERS by the BANK OF NEW ZEALAND.

## Gold from Auckland.

Locality.	Weight.	Estimated Gold.	Cost Price per Ounce.	Remarks.
Coromandel -	106-200 ozs.	ozs. dwts. grs. 29 0 2	£ s. d. 3 1 0	From the Union Beach Gold Mining Company, two specimens.
Grahamstown -	108 ozs.	12 0 0	2 15 6	From Caledonian mine. Found 280 feet from the surface in the No. 5 reef composed of alternate bands of sandstone and quartz reef, 5 feet thick. This reef runs nearly parallel to a reef which gave 585,000 <i>l.</i> in division within two years. Three specimens. Silver, 32 per cent.
Grahamstown -	85 ozs. 16 dwts.	11 0 0	2 15 0	From the Cure mine. Same reef as Caledonian claim, adjoins, and at the same level. Four specimens. Silver, 32 per cent.

## Gold from Otago.

Number on Map.	Number of Specimens.	Locality.	Weight.	Cost Price.	Average Assay (decimally expressed) 9'167 British Standard Gold.	Average Loss per cent. in Melting.	Remarks.
I.	1	Queenstown, Moke Creek.	ozs. dwts. grs. 1 0 0	£ s. d. 3 15 6	-	-	Terrace claim, tunnel work. Has paid 3 <i>l.</i> 10 <i>s.</i> per man per week for past 12 months.
	2	Queenstown, Moonlight Creek.	1 0 0	3 15 6	-	-	Terrace claim, tunnel work. At work for seven years, averaging almost 4 <i>l.</i> per man per week.
	3	Queenstown, branches of Upper Shotover.	1 0 0	3 15 6	9'475 alloy silver	2'16	Ground sluicing.
	4	Queenstown, Moonlight Creek.	1 0 0	3 15 6	-	-	Ditto.
	5	Queenstown, Tuden Mill, side of Lake Wakatipu.	1 0 0	3 15 6	-	-	Ditto.
	6	Queenstown, Big Beach, Shotover.	1 0 0	3 15 6	-	-	Ground sluicing. Claim worked by 40 Chinamen, the weekly earnings being 25 oz.
II.	7	Arrowtown -	7 0 12	26 11 7	9'545 alloy silver	1'97	Large sized nuggets, characteristic of the yield of the district.
	8	Macetown -	1 0 0	3 15 6	9'540 "	2'25	Ditto.
	9	Cardrona -	0 17 12	3 8 1	5'600 "	1'75	Ditto.
III.	10	Cromwell, Nevis and the Kawaran Gorge.	4 2 18	15 12 5	-	-	-
	11	Do. -	1 0 0	3 15 6	-	-	Obtained by cradling, banks of the Clutha river.
	-	Do. Brown's Flat.	1 0 0	3 15 6	-	-	Obtained by sluicing, Brown's Flat, Kawaran river.

Number on Map.	Number of Specimens.	Locality.	Weight.	Cost Price.	Average Assay (decimally expressed) 9'167. British Standard Gold.	Average Loss per cent. in Melting.	Remarks.
			ozs.dwt.grs.	£ s. d.			
III.	12	Cromwell, Brown's Flat.	1 0 0	3 15 6	—	—	—
	13	Do.	1 0 0	3 15 6	9'580 alloy silver	3'13	Obtained by sluicing, the Ten mile Tynewell creek.
	14	Do.	1 0 0	3 15 6	- - -	- - -	Obtained by sluicing, Doctor's Flat, Bannockburn.
	15	Cromwell, Gentle Annie.	1 0 0	3 15 6	- - -	- - -	Ditto.
	16	Cromwell, Lowburn.	1 0 0	3 15 6	9'580 alloy silver	3'13	Obtained by sluicing, Creek Terrace workings.
	17	Cromwell, Bannockburn.	1 0 0	3 15 6	- - -	- - -	Ditto.
IV.	18	Alexandra - -	0 15 0	2 16 8	9'635 alloy silver	2'47	Obtained by sluicing, River river workings.
V.	19	Roxburgh - -	0 10 0	1 17 9	9'530 "	2'64	- - -
VI.	20	Naseby, Spec Gully	1 0 0	3 15 6	- - -	- - -	Obtained by sluicing, River river workings.
	21	Naseby, Surface Hill.	1 0 0	3 15 6	9'800 alloy silver	3'14	Ditto.
	22	Naseby, Kyeburn -	1 0 0	3 15 6	The rare metal Iridium is occasionally associated with gold from the Naseby field.	- - -	Ditto.
VII.	23	St. Bathans - -	1 0 0	3 15 6	- - -	- - -	Ditto.
VIII.	24-33	Palmerston - -	10 0 0	37 15 0	9'565 alloy silver	3'88	—
IX.	34	Lawrence - -	1 0 0	3 15 6	- - -	- - -	Ordinary yield of the district.
	35	Do. - -	2 15 0	10 7 8	9'665 alloy silver	3'36	Large nuggets.
	36	Do. - -	1 0 0	3 15 6	- - -	- - -	From the stamper boxes of the Otago Gold Mining Company, obtained from cement.
X.	37	Naitahuna - -	1 0 0	3 15 6	9'685 alloy silver	3'75	Ordinary yield of the district.
	38	Do. - -	1 0 0	3 15 6	9 "	- - -	Obtained from auriferous cement, sluicing claim, Nuggetty Hill.
XI.	39	Tapanui - -	1 0 0	3 15 6	9'810 alloy silver	3'40	Obtained from auriferous drift, under 6 feet of clay on a large flat. Waikaka diggings.
XII.	40	Tokomairiro - -	1 0 0	3 15 6	9'580 "	4'15	Ordinary yield of the district.
XIII.	41	Oamaru - -	1 0 0	3 15 9	9'755 "	3'99	Ordinary yield of the district, Maruwhenua gold field.

Gold : specimens, exhibits, and description.

Specimen 42. Auriferous quartz from the Phoenix Claim Skippers. Width of lode 8 feet; sample taken from a depth of 240 feet. The battery used for crushing is one of 30 stampers, driven by a turbine wheel. Proprietors, Messrs. F. and G. T. Bullen. Manager, Mr. F. Evans. A first crushing of 40 tons of this stone yielded 239 ozs. gold.

No. 43. Auriferous quartz from the Nugget and Cornish Quartz Mining Company. Width of lode from 12 to 18 feet; sample taken from a depth of 80 feet. The mine is worked by adits running into the hill and back sloped. Machine for crushing consists of 12 head of stampers, the motive power being a turbine wheel (Whitelow and Kerrat's patent). Manager, Mr. T. F. Roskrye.

#### 16. Government of New Zealand.

Specimens of alluvial gold from Nelson and Westland, and of auriferous quartz from the west coast; specimens of alluvial gold from Otago; bars of melted and refined gold; model representing gold exported from New Zealand, 1862-1875.

#### Class 100.—Alluvial Gold from the Province of Nelson and County of Westland.

1. Alluvial gold from Moonlight Creek, Nelson, procured by washing the beds of creeks.

2. Alluvial gold from Waimea, Westland, obtained by washing beds of creeks. Samples taken from district through which the proposed Great Waimea Water Race would run. Gold: specimens, exhibits, and description.

3. Fine sea drift, Okarito, Westland, obtained by washing and sluicing the sea beaches.

4. Alluvial from Ross, Westland, obtained by deep sinking, where the use of steam machinery is found to be necessary.

5. Equal parts of coarse and fine alluvial from the Lyell, Nelson, obtained by washing the beds of water-courses.

6. Alluvial from Grey Valley, Nelson, obtained by sluicing.

7. Alluvial sluiced, from Duke of Edinburgh Terrace, Greenstone Creek, Westland. The locality whence this sample came is traversed by the extensive Greenstone and Eastern Hohenu Water Race.

8. Alluvial from the Ho-Ho, Westland, obtained by sluicing ground that had been previously worked by shafts and tunnels.

9. Fine alluvial gold from iron-sand cement, Charleston, Nelson. This sample of gold is usually saved by amalgamation with mercury, and is most difficult to obtain in its present form.

10. Ruby sand from Charleston, Nelson. This sand is found in granite, and the gold it contains is heavier and of better quality than that in cement.

11. Gold-bearing black sand from the Black Lead, Charleston, Nelson.

12. Auriferous cement from Mokihinui River, Nelson. Obtained 50 feet below surface of river terrace.

13. Auriferous cement from black lead, Charleston, Nelson.

14. Auriferous sand from Addison Flat, Nelson.

15. Alluvial gold. Wahamarino River, Marlborough.

16. 5 ozs., washed from the ocean beach below high-water mark.

17. 5 ozs., obtained from a black sand lead about 50 yards inland from high-water mark.

18. Sample of the ordinary obtained from sluicing claims about 12 miles inland.

19. Sample nuggetty gold obtained from Moonlight Creek, rising in high ranges about 20 miles inland.

Quartz specimens are from the Inangahua district. The gold being fine is not easily seen in the stone.

*Enterprise Company, Registered.*—These specimens were taken from the middle tunnel, at a distance of 120 feet from the mouth of the drive, at a depth of 85 feet from the surface.

*Energetic Company, Registered.*—The stone was taken—(1) from a shaft sunk 85 feet below a tunnel and 210 feet below the surface. A trial crushing in February 1872 of 10 tons of this stone gave a result of 43 oz. 1 dwt. retorted gold. (2) From No. 2 tunnel, 265 feet below the surface, and at a distance of 298 feet from the mouth of the drive, at which place the reef is 4 feet 6 inches thick, and very solid.

*Rainy Creek Company, Registered.*—The width of the reef where discovered is 30 feet, and it carries this extraordinary width for 900 feet. Gold appears to be well distributed throughout the reef, and at the lower level it is heavier than at the surface.

*Thompson's Claim, Boatman's Inangahua.*—Shows a width of from 2 to 5 feet, and will yield from 1 to 2 oz. to the ton.

*El Dorado Company, Registered.*—Several small specimens. The reef where first opened was 3 feet in width. Further south it was cut 5 feet in width. The gold is fine, and well distributed throughout the stone. Zircons, garnets, cubical pyrites, manganese, and sulphides of antimony are also found.

*Just-in-Time Company, Registered.*—The reef is 3 feet 6 inches wide. Specimens taken 15 feet below the level of the tunnel.

*Victoria Company, Registered.*—Reef averages 3 feet in thickness. The specimens are taken from a level 360 feet below the highest point proved.

*All Nations.*—This reef is making to the south-west and has an average thickness of 2 feet.

Gold: specimens,  
exhibits, and  
description.

*United Band of Hope Company, Registered.*—Specimen 1 was taken from the surface where the reef first opened. From this about 100 tons of stone crushed gave a return of 2 oz. 6 dwts. per ton. From this level to a depth of 140 feet, about 80 tons crushed gave at the rate of 18 dwts. per ton. No. 2 is from a depth of 160 feet. From this last 31 tons crushed at Westland machine gave a gross yield of 41 oz. melted gold.

*Golden Hill Company.*—The reef varies from 4 feet to 1 foot 6 inches, average 2 feet 6 inches. About 480 tons of stone crushed at the Westland machine gave a yield of  $\frac{1}{2}$  oz. to the ton.

*North Star Company, Registered.*—The specimen was taken from a level of 50 feet from the surface, a foot on the reef. The reef is 5 feet in width, bearing about E. and W.

*Invincible Gold Mining Company, Registered.*—This specimen is from the surface, at a width of 2 feet on the reef, which is here 4 feet 6 inches thick.

*Wealth of Nations Company, Registered.*—Two large bodies of stone have been intersected, each about 10 feet thick, showing gold similar to that in the outcrop.

#### SILVER ORES.

Silver ores.  
Exhibits and  
descriptions.

The silver exported from the colony has been chiefly extracted from the gold obtained at the Thames, which is alloyed with about 30 per cent. of the less valuable metal.

Within the last two years, however, several mines have been opened where the ore is argentiferous galena that yields 20 to 50 ozs. of silver to the ton. In some cases the galena is mixed with iron pyrites that yields a fair percentage of gold.

Nelson.

A mine has recently been opened in Nelson at Richmond Hill, where the ore is a form of shermite, a mixed ore containing silver, bismuth, and copper, the silver being at the rate of 70 ozs. per ton.

1. One bar of melted gold from West Coast, Kokitika, Westland—

Assay—Gold	-	·9627 = Fine Gold	-	9	14	16
Silver	-	·0363				
Copper	-	·0010				
Weight, 10 oz. 2 dwts. 6 grs.						

2. One bar of melted gold from Thames District, province of Auckland—

Assay—Gold	-	·6565 = Fine Gold	-	6	12	18
Silver	-	·3390 = Silver	-	3	8	13
Copper	-	·0045				
Weight, 10 oz. 2 dwts. 6 grs.						

3. One bar of refined gold, as extracted by Chlorine Refining Process, and as exported by the Bank of New Zealand, Auckland—

Assay—Gold	-	·9942 = Fine Gold	-	9	19	20
Silver	-	·0058				
Weight, 10 oz. 1 dwt.						

4. One bar of chloride of silver. The gold having been separated by the Chlorine Refining Process, the chloride is reduced to metallic silver by the galvanic action of iron plates and acidulated water. Weight, 8 oz. 2 dwts. 6 grs., containing 6 oz. of silver.

5. One bar of silver, extracted from Thames gold, province of Auckland, by Chlorine Refining Process. Very nearly fine silver, only a trace of gold left. Weight 10 oz. 4 dwts. 18 grs.

6. Model representing a bar of gold, weighing 375 oz., as exported by the Bank of New Zealand, Auckland.

*North of Nave, Columns 10 to 17.*

#### DEP. I.—MINERALS, ORES, STONE, MINING PRODUCTS.

The mining capabilities of the colony promise an extensive field for development; as yet comparatively little has been done compared to the pastoral industries. Ores, mining products, minerals, and stones are plentiful.

## IRON.

No iron mines are at present worked, though almost every known variety of iron ore has been discovered in the colony, the workings being limited to the black sands, which occur plentifully on the coasts. There are also few soils or stream gravels that will not yield a considerable quantity when washed. The chief deposits are, however, on the sea shore of the west coast of both islands, the best known being that at Taranaki.

Iron mines  
unworked—  
workings,  
black sands.

Several companies have been formed both in England and the colony to manufacture steel direct from this iron sand; they have not, however, succeeded, but a partial success has been attained lately by a new company by smelting in furnaces bricks formed of the ore and calcareous clay and carbonaceous matter; it remains to be proved, however, if it can be treated in large quantities by these means.

At Parapara, Nelson, immense quantities of brown hematite ore occurs on the surface of the ground; some of this was converted into iron at Melbourne in 1873, and gave on analysis:—

Brown hematite  
ore.

Iron	-	-	-	97·668
Manganese	-	-	-	·268
Carbon combined	-	-	-	·542
" free (graphite)	-	-	-	·208
Silicon, with titanium traces	-	-	-	1·004
Phosphorus	-	-	-	·041
Sulphur	-	-	-	·269

100·000

Its principal characters are colour uniform, approaching white; structure homogeneous, and finely granular, hard, brittle. This is therefore the variety called white iron.

1. *Parapara Iron and Coal Company, Nelson.*

a. Brown hematite ore.

Iron ores:  
exhibits and  
descriptions.

2. *Johnstone Brothers, Nelson.*

Hematite iron ore, similar to No. 1, easily convertible into the best steel. Brown and red paints are made from this ore. (*See Paints and Dyes.*)

Red hematite as specular iron ore occurs in large quantities in the serpentinous rock near Nelson, and near Maori Point, on the Shotover River, where it forms a bed 6 feet in thickness; it occurs also at Helensborough, Otago. At D'Urville Island a compact ore occurs in diorite slate yielding 63 per cent. of iron. The pebbles of this ore are known to diggers as "Black Maori."

Magnetic iron ore, though occurring chiefly as black sands, is found in several parts of the colony; it occurs as vein ore 16 inches thick in serpentinous slates at Dun Mountain, Nelson, and in a vein in mica schist at Wakatipu Lake, Nelson, and at Maramara, Frith of Thames, in a vein in ferriferrous slates, and contains also oxides of titanium and manganese.

3. *Nelson Committee, Nelson.*

a. Chrome iron ore from the Dun Mountain, Nelson, obtainable in unlimited quantities, and iron ore from Bedstead Gulley, Collingwood, Nelson.

4. *Louisson, T. B., Nelson.*

Iron ore as found in the Parapara District, Collingwood, and calcined iron ore.

6. *Taranaki Committee.*

a. Titanic iron sand.

7. *Colonial Museum, Wellington. (James Hector, Director.)*

a. Red hematite. Anhydrous oxide.

*Specular Iron Ore.*—Dun Mountain, Nelson. Occurs in irregular veins in greenstone rocks; contains 63 per cent. of metallic iron.

*Specular Iron Ore.*—Maori Point, Shotover, Otago. A 6 foot vein in mica schist, equally rich with the above; extent unknown.

*Compact Iron Ore.*—D'Urville Island, Nelson. Vein, thickness unknown, in diorite slate, with serpentine and chrome; yields 63 per cent. of iron.

Iron ores :  
exhibits and  
descriptions—  
cont.

**Magnetic Iron Ore.**—This valuable ore, though occurring chiefly as black sands, is found in several parts of the colony.

**Magnetic Iron Ore.**—Dun Mountain, Nelson. From a vein 16 inches thick in serpentinous slates.

**Magnetic Iron Ore.**—Wakatipu Lake, Otago. From a vein in mica schists.

**Magnetic Iron Ore.**—Maramara, Frith of Thames. From a vein in ferri-ferrous slates; contains also oxides of titanium and manganese.

**Black Iron Sand.**—From beach at Taranaki.

**Iron Band Ore.**—Contains 70 per cent. of iron. Also Wyndham River, Otago, and Manuka, Auckland; formed by the black sand layers becoming cemented with hematite. This would be a most valuable ore if obtained in large quantities.

TABULAR STATEMENT OF IRON SANDS.

Locality.	Matrix from whence probably derived.	Magnetite.	Hematite.	Titanite.	Per cent. of Iron.	—
Upper Buller river, Nelson	Hornblende rocks	87.5	9.4	—	70.2	Auriferous.
Lower Buller river, "	Tertiary gold drift of diorite slate	54.0	—	42.3	59.0	
Upper Molyneux river, Otago	Mica schist	82.7	—	9.7	65.9	
Lower Molyneux river, "	Mica schist and tertiary strata	74.4	—	2.5	58.7	
Mountain stream, Canterbury	Paleozoic slates	62.7	37.2	—	66.2	Auriferous.
Otago	"	36.1	10.5	—	58.5	
Tuapeka, Otago	Old gold drift	2.2	92.8	—	63.8	
Wakatipu, Otago	Mica schist	80.0	7.6	—	52.9	
Mataura river (Upper)	Diorite slate	9.8	—	70.9	41.2	Auriferous.
"	Old gold drift	63.5	16.1	8.0	60.6	
Stewart Island	Granitic rocks with greenstone dykes	77.8	—	20.1	57.3	
"	Hornblende rocks	71.5	20.0	8.2	70.1	
Anatoke, Nelson	Granite and hornblende	79.8	7.7	3.4	60.2	Auriferous, with garnets, topaz, diathene, &c.
Mahinepoa lake (old channel of Hokitika).	River drift from diorite rocks	—	—	58.0	29.1	
Sea beach, Hokitika	Sea sand drift	75.0	—	—	54.0	
Motueka river, Nelson	Tertiary strata and granite	33.0	32.5	—	42.0	
Wairan river, Marlborough	Tertiary strata and granite schist	21.0	48.4	—	38.9	"
Wanganui river, Nelson	Granite and tertiary	54.0	13.0	—	43.2	
Saddle hill, Otago	Basaltic	53.3	—	25.6	52.9	
Green island, Otago	Basaltic or sea beach	53.3	—	29.6	50.3	
Hooper inlet	"	30.0	—	74.2	53.0	Auriferous and platiniferous.
West Bluff, Southland, Poveaux straits.	Diorite or sea beach	12.2	—	40.6	23.6	
D'Urville island, Nelson	Diabase and granite	78.6	—	—	57.4	
Taranaki beach	Trachyte	91.9	—	6.2	70.1	
"	"	71.0	—	—	56.1	Olivine and hornblende.
Tauranga beach	"	87.4	8.6	—	68.0	

MASSIVE IRON ORES, OXIDES AND TITANITES.

Variety.	Locality.	Centesimal Composition.					Per-centage of Iron.	Remarks.
		Magnetite.	Hematite.	Titanic Iron.	Siliceous Matters.	Water.		
Impure magnetite	Manakan, Auckland	60.20	37.90	Traces	1.90	—	70.06	Manganese oxide 1.38. Contains a little manganese.
Magnetite	Dunstan gorge, Otago	86.32	—	Traces	13.68	—	63.60	
Hematite	Dunstan, Otago	—	96.11	—	3.89	—	68.30	
Magnetite	Dun mountain, Nelson	—	90.62	—	7.60	1.80	63.49	
Mixed magnetite and hematite.	Maramara, Auckland	2.24	87.10	Traces	10.66	—	62.30	
Bog iron ore	Spring Swamps, Auckland	—	73.17	—	13.83	13.00	51.22	
Brown iron ore	Raglan	—	72.69	—	9.03	17.60	50.88	
"	Kawan	—	67.98	—	19.65	12.37	47.58	
Hydrous hematite	Parapara, Nelson	—	62.68	—	24.08	13.24	43.87	

## BLACK BANDS OR SPATHIC IRON ORES.

Variety.	Locality.	Protoxide of iron.	Sesquioxide of iron.	Carbonic Acid.	Silicates.	Per-centage of iron.
Blackband - -	Collingwood, Nelson -	35·23	25·77	21·12	3·08	46·06
Blackband - -	Collingwood, Nelson -	40·38	5·26	21·97	16·69	35·12

*Spathic Iron Ores.*—This occurs in considerable quantity in the Collingwood Iron ores: district, in most cases more or less oxidized; one ore known as Black Band is exhibits and one of the most valuable kinds known, and alternates with the coal seams. descriptions—A specimen of a siliceous and spathic iron ore from Otaniatana gully is cont. approximately constituted as follows:—

Carbonate of iron	-	-	-	56·9
Carb. lime and magnesia	-	-	-	2·8
Siliceous matters	-	-	-	40·3
				<u>100·0</u>

The iron amounts to about 27 per cent.

*Carbonaceous iron ore* with coal seams, Collingwood.

Hematite, Collingwood, exhibited by Johnston and Louissou, Nelson.

Hematite (about 40 per cent. of iron) Collingwood, Nelson, occurs inter-mixed with quartz pebbles, in a strata 100 ft. thick exposed over several acres.

## ANALYSIS OF TWO SPECIMENS.

	Spathic Iron Ores.	
	Malvern Hills.	Collingwood.
Protoxide of iron - - - -	51·2	35·23
Sesquioxide of iron - - - -	—	25·77
Oxide of manganese - - - -	·8	1·00
Alumina - - - - -	1·8	2·11
Magnesia - - - - -	·4	1·94
Lime - - - - -	·8	·71
Silica - - - - -	18·6	·90
Sulphuric acid - - - - -	—	Traces.
Carbonic acid - - - - -	31·2	21·12
Phosphoric acid - - - - -		{ not determined.
Sulphide of iron - - - - -		·41
Water - - - - -	·7	1·96
Organic matter - - - - -	—	5·72
Silicates undecomposed by acids - - -	—	3·03
	100·00	100·00

Ironstone, Malvern, Canterbury, exhibited by Wilson, Christchurch, Canterbury.

Ironstone, two specimens, exhibited by E. Ford, Christchurch, Canterbury.

*Brown hematite* or hydrous oxide also occurs in Assuri in great quantity.

*Reniform iron ore*, Mongonia.

Iron ores :  
exhibits and  
descriptions—  
cont.

*Bog iron ore*, Spring swamps, Auckland, forms thick layers at the bottom of swamps. Though rich in iron the ore is inferior on account of the sulphur and phosphorus it usually contains.

*Hematite*.—Exhibited by W. Loddar, Auckland.

An analysis of this ore from Raglan gave—

Sesquioxide of iron	-	-	-	72·69
Oxide of manganese	-	-	-	·31
Alumina	-	-	-	2·02
Magnesia	-	-	-	·69
Lime	-	-	-	·58
Phosphoric acid	-	-	-	not estimated
Sulphide of iron	-	-	-	·11
Hygroscopic water	-	-	-	4·61
Constitutional water	-	-	-	13·02
Silicates undecomposed by acids	-	-	-	5·97
				<hr/> 100·00 <hr/>

### CHROME ORES.

Chrome ores :  
exhibits and  
descriptions.

This ore, which is a mixture of chromic iron and alumina, is associated with magnesian rock, resembling olivine in composition, named dunite by Dr. Hochstetter. It occurs in veins often 12 feet in thickness, and sometimes contains as much as 80 per cent. of chrome ore. This ore has been largely exported from Nelson, and has been used for the manufacture of salts of chromic acid, possessing the properties of brilliant dyes. The pure ore contains 50 per cent. of the chrome oxide, and is worth 11*l.* to 20*l.* per ton, according to the state of the market.

*Massive chromic iron.*

*Crystallized chromic iron.* From irregular lodes in serpentine bands, Dun Mountain, Nelson.

*Colonial Museum, Wellington. (James Hector, Director.)*

Compound of iron sand, ferruginous earth, and ground charcoal.

Iron sand cemented by heat.

Bloom of iron.

Bar of crude metal, as from the blast furnace.

Bar of crude titanite steel.

Bar of workable steel.

Copper mines.

Copper mines have been worked in Auckland on the Barrier Island, and in Kawan Island, and to a small extent in Doubtless Bay. It has been found associated with the metamorphic rocks in Otago and at Waipori, where a four foot sulphide of copper (pyrites) lode exists; an attempt to trace this lode was made for a short time and then abandoned.

A carbonate of copper is found in the same vicinity, but only in rolled fragments.

### 3. Nelson Committee.

a. Copper ore from Dun Mountain at Nelson.

Sulphuret of copper from Parapara Valley.

### 7. Colonial Museum, Wellington.

Copper pyrites.

a. *Cupreous iron ore* in serpentine, Dun Mountain. Interesting from its being slightly auriferous. The present value of crude (unrefined) copper is 30*l.* per ton.

*Copper pyrites at Wakatipu Lake.*

*Copper pyrites*, from a lode 3 to 5 feet thick in mica schist, Moke Creek, Wakatipu Lake; it is associated with carbonate and native copper. The ore contains the high proportion of 11 to 55 per cent. of metallic copper, the usual average of Cornish ore being only 5 per cent. There is limestone in close vicinity to the lode, so that there would be no difficulty in reducing the ore to a "regulus," in which state it would save cost in shipment.

## COPPER ORES.

Decimal Company's mine, Collingwood, Nelson.

Copper ores.

This lode has been opened up and contains 22 to 25 per cent. of metallic copper.

*Grey sulphide*, Wangareka, Nelson, contains 55 per cent. of copper, together with a little silver and gold.

On the west coast of Otago, at Charles Sound, there is a copper bearing lode, associated with granite rocks.

In Kawan Island, Auckland, the lode first produced 16 per cent. of copper, and then fell off to 8 per cent, and at the bottom of the workings about 5 per cent. The width of the lode was 8 feet. The workings were discontinued on account of the high price of coal consequent on gold discoveries.

In Barrier Island the ore (pyrites) occurs in a quartz matrix; a fair sample of the mixed specimen afforded 26·62 per cent. of copper. The Otea Copper Mining Company have worked a pyrites ore to a considerable extent.

## LEAD ORES.

*Lead* occurs as galena in the province of Nelson and also at the Thames Lead ores. Gold Field.

It invariably contains silver to a considerable amount.

3. *Nelson Committee, Nelson.*

a. Galena from Bedstead Gully, Collingwood.

Galena.

Galena and zinc blende from Parapara Valley.

5. *Washbourn, W. E., Nelson.*

Argentiferous lead ore from Richmond Hill, Parapara, value 50l. per ton.

7. *Colonial Museum, Wellington.*

a. *Galena*, Wangapeka, Nelson. Sulphide of lead, with quartz that contains also sulphides of iron, and antimony with gold, in veins of felspathic schist; the galena contains 26 ozs. of silver per ton. The gold is only in those parts of the ore that contain iron pyrites.

*Galena*, with zinc blende, Perseverance Mine, Collingwood, Nelson. Occurs *Galena*. in a band, 2 to 5 feet thick, parallel with auriferous quartz veins, those two ores are both pure, but so intermixed in the lode, that they could not be reduced separately. 100 tons have been sent to Great Britain to test the value of this ore.

## ZINC (YELLOW OR HONEY BLENDE).

This ore occurs at the Perseverance Mine, Collingwood, Nelson, and in small quantity in Tararua Creek, Thames, in white cement with auriferous veins. It contains 60 per cent. of metallic zinc, which is worth about 15l. per ton. Zinc.

3. *Nelson Committee.*

a. Zinc blende and galena from Bedstead Gully, Collingwood.

7. *Colonial Museum.*

Zinc or yellow or honey blende from Perseverance Mine, Collingwood, Nelson.

## ANTIMONY.

Stibnite lodes were discovered in 1873 near the coast of Queen Charlotte Sound, Marlborough, and proved to contain from 51·12 to 69·40 per cent. of antimony, the matrix being quartz. It also occurs at the Wakatipu Lake, and in a lode in the Shotover district, and in the neighbourhood of Waipori. Antimony.

A sulphide of antimony lode occur three miles south of Collingwood, containing no less than 75·7 per cent. of silver, which is equal to 185·88 troy ounces per ton.

3. *Nelson Committee.*

a. Antimony ore from Inaugahua.

Antimony from Rainy Creek, Reefton.

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## MANGANESE.

## Manganese.

This ore is useful for generation of chlorine for bleaching purposes, also for calico printing, &c.

The values of these common ores are from 3*l.* to 4*l.* per ton.

## 7. Colonial Museum, Wellington.

*Rhodonite* (silicate of manganese), Dunstan, Otago, as rolled masses, percentage of manganese about 40.

*Wad* (hydrous oxide), Port Hardy, D'Urville's Island, Nelson, percentage of manganese about 45.

Braunite or manganese, on Malvern Hills, Canterbury. Exhibited by E. Ford, Christchurch, Canterbury.

Ores are also found at Whangarei in Auckland, and in Napier; the latter contains 44 per cent. of manganese oxide, the remainder is mostly clay.

## MINERAL OILS.

## Mineral oils.

In 1866 attention was directed to the recourses of the colony in respect to petroleum, and some very fine oils were found. There are three principal localities, and these produce each a distinct kind of oil:

1. The Sugar Loaves in the Taranaki Province.
2. Poverty Bay, on the east coast of the province of Auckland.
3. Mauntahi, Waiapu, East Cape.

The oil from the first has a very high specific gravity, .960 to .964 at 60° Faht., water at 1. It has thus too much carbon in its composition for its commercial success as an illuminating oil, but is capable of producing a valuable lubricating oil. It resembles oil occurring in Stanta, Barbara County, California.

The second kind from Waiapu, Poverty Bay, is a true paraffin oil resembling the Canadian oil. By three successive distillations, and treatment with acids and alkalis, about 65 per cent. of a good illuminating oil is obtainable with specific gravity of .843.

The third produces a pale brown oil, nearly or quite transparent, specific gravity .829 at 60° Faht., burns well in a kerosene lamp for some time, and is therefore of a very superior class, it contains only traces of paraffin, and produces 84 per cent. of an obtainable oil, fit for use in kerosene lamps, by means of a single distillation.

By two more distillations 66 per cent. of the crude oil has a specific gravity of .811, which is that of common kerosene.

## 7. Colonial Museum, Wellington.

*b. Petroleum (rock oil)*, oozes from cracks in trachyte breccia, Sugar-loaf Point, Taranaki. Wells have been bored to the depth of many hundred feet, but no steady supply of oil has been obtained. Crude oil has a specific gravity of .962 at 60° Faht., and yields by fractional distillation oils having the following gravities:—

2	per cent. of oil of specific gravity	.874
10	"	.893
8	"	.917
60	"	.941
<hr/>		
80	total distilled off.	
6.1	solid bitumen.	
12.4	fixed carbon.	
1.5	ash.	
<hr/>		
100.0		
<hr/>		

**Petroleum.** Waipawa River, Poverty Bay, Auckland.

Mineral oils.

2	per cent of oil, specific gravity	·809 (colourless).
16·0	"	·826 (nearly colourless).
16·0	"	·836 (pale yellow).
19·0	"	·850 (dark yellow).
11·0	"	·855 (brown, solid at 40° Faht.)
8·0	"	·864
21·25	paraffin oil.	

93·75 total distilled off.  
6·25 residue in retort, pitch.

100·00

**Petroleum.** Waipapu, East Coast, Auckland Province. The crude oil has a specific gravity of ·872 at 58° Faht.; boiling point, 290° Faht.; flashing point, 230° Faht. A sample with a specific gravity of ·8294 gives—

40·0	per cent. of oil, specific gravity	·800 (colourless).
33·0	"	·826 (pale coloured oil).
12·5	"	·840
6·25	"	·860
4·25	"	·870

96·00 total distilled off.  
4·00 residue in retort.

100·00

Another analysis yielded—

11·20	per cent., specific gravity	·820 fine lamp oil.
37·75	"	·853 inferior lamp oil.
26·69	"	lubricating oil.
16·00	"	paraffin.

90·64 total distilled off.  
9·36 bituminous residue.

100·00

## 13. Ross, A., Poverty Bay, Auckland.

**Petroleum Oil Shales.**—Pyroschist or bituminous shales. These occur to Oil shales. a small extent in the upper portions of the coal formation. Specimens have been examined from D'Urville's Island, in Cook's Strait, Uongonin, Kaikorai, in Otago Torbani Hill.

A splendid series of oil producing shale is obtained from the Chatham Islands. It contains traces only of sulphuretted hydrogen.

These shales have been distilled for oil, those from Taranaki and Chatham Islands producing excellent results.

## OIL SHALES.

Locality.	Centesimal Composition.					Relative per-centage of Volatile Matter.	Relative per-centage of fixed Carbon.
	Volatile Matters.		Water.	Asb.	Sulphur.		
D'Urville's Island	81·79	7·98	·69	9·54	Traces.	91·11	8·89
Mongonui	75·20	9·80	1·80	13·70	"	88·99	11·01
Chatham Island	66·43	20·41	4·61	8·55	"	76·49	23·51
Chatham Island	64·67	19·87	7·13	8·33	"	76·49	23·51

## GEOLOGICAL SPECIMENS.

6. *Taranaki Committee.*Geological  
specimens.

Older tertiary marl, North Tarendir.

Trachyte pebble.

Trachyte, with crystals of hornblende.

Trachyte cast from a well in New Plymouth, ancient sea beach 500 yards inland of present beach.

Older tertiary marl, white cliffs.

Hornblende.

Obsidian.

Nephrite.

Tarakanite.

Cornelian, found on beach, New Plymouth.

3. *Nelson Committee, Nelson.*

Steatite from Golden Gully, Collingwood.

7. *Colonial Museum, Wellington.*

Steatite, Collingwood, Nelson, occurs in a large mass or dyke in the Parapara Valley.

## GRAPHITE.

Graphite.

The mineralized substance known as graphite—plumbago—black lead—consists of carbon in mechanical admixture with siliceous matters, as clay, sand, or limestone, and in varying proportions, and is the ultimate product of vegetable remains, mineralized to the highest degree.

It has been found at Pakanan, in the vicinity of Wellington, and in the pure state embedded in marbles from the west coast.

The amorphous variety is used for the manufacture of pencils, &c., and the crystalline for lubricants for machinery, while the impure siliceous or argillaceous graphites find extensive employment in the manufacture of crucibles, and for polishing material for iron work.

Graphite of the first quality has not been found yet in any quantity in New Zealand, but there is an abundance of the impure varieties. It has been found in greater quantity in the province of Nelson than elsewhere, but still many other localities yield this mineral in various states of purity, as at Dunstan, Otago, which is of fair average quality.

## BUILDING STONES.

Building stones.

Abundant supplies of excellent stones for roads and building purposes are found in every part of the colony of New Zealand.

The varieties useful as such, may be divided into—

1. Basalts and diorites.
2. Trachytes and granites and crystalline schists.
3. Limestones (freestones in part).
4. Sandstones (freestones).

1. *Basalts*, locally called “bluestones,” occur of a quality useful for road metal, house blocks, and ordinary rubble masonry. They are found partly underlying and partly overlying the tertiary rocks, interstratified with tuffaceous clays and local beds of altered volcanic ash. In this North Island these volcanic rocks are largely developed, and include some of very recent date.

Lavas and  
scoriæ.

True lavas and scoriæ are of frequent occurrence over a large portion of the islands. The latter have been quarried by Maori prisoners at Mount Eden, Auckland, their colour is dark grey, and though absorbent they are very hard and coherent.

In the South Island, on the other hand, the igneous rocks appear to be of much earlier date, and to have been nearly all of submarine origin. They are principally confined to the eastern sea-board, only rarely occurring at greater distance than 40 miles from the coast.

The Halswell quarries, Canterbury, produce an exceedingly hard and close-grained stone of a dull leaden grey colour; but its excessive hardness will necessarily limit its usefulness.

In Tables I. and II. the constituents of these rocks are shown.

TABLE I.—BASALTIC AND TRACHYTIC ROCKS.—ULTIMATE CONSTITUENTS.

Name and Locality.	Specific Gravity.	Soluble in Acid.	Silica.	Alumina.	Iron Oxides.	Lime.	Magnesia.	Alkalies.	Water of Constitution.	Colour.
Trachyte porphyry, Portobello	2·445	5·86	66·40	24·35	1·52	0·54	Trace	6·54	1·10	Grey.
Trachy - dolerite, Flagstaff Hill.	2·519	11·46	59·32	21·06	5·93	7·36	0·20	5·57	1·20	Dark greyish green.
Clinkstone (spheroidal) Bell Hill.	2·621	17·55	54·19	21·27	6·61	3·50	Trace	10·27	1·04	Light grey.
Clinkstone (laminated) Blanket Bay.	2·660	24·11	55·65	23·32	4·86	2·15	"	10·46	4·31	Light green.
Vesicular basalt, Kaikorai	2·589	32·71	42·74	5·61	23·17	5·31	7·47	10·74	3·00	Reddish grey.
Porphyritic basalt, Pine Hill	2·869	33·79	48·06	20·45	12·12	8·87	Trace	5·06	2·06	Dark blue grey.
Dolerite, Kaikorai	2·875	41·79	40·51	20·71	12·09	10·35	5·11	9·83	1·90	Bluish grey.

No. 3 contains 3·94 per cent. of carbonic acid.

TABLE II.—BASALTIC AND TRACHYTIC ROCKS.

Name and Locality.	Specific Gravity.	Soluble in Acids.	Insoluble in Acid.	Nature and Amount of Soluble Substances.						Hardness.	Action of Glauber's Salts.	Colour.
				Alumina.	Oxide of Iron, and sometimes Manganese.	lime.	Magnesia.	Alkalies.	Water of Con- stitution.			
Vesicular basalt, Auckland	—	18.80	81.20	13.80	Trace	.62	3.01	.77	.60	4.5	Slight	Dark grey.
Basalt, Dunedin, back of Laboratory	2.745	—	75.34	11.83	2.75	1.50	.76	3.93	3.25	—	—	Grey.
Basaltic conglomerate, Port Chalmers, Otago	2.538	29.07	70.93	3.13	9.51	6.04	Trace	2.45	.68	4.5	Slight	Grey. Carbonic acid 8.75.
Basaltic conglomerate, Pine Hill	—	32.79	67.00	24.43	—	1.60	1.45	3.18	2.05	—	—	—
Basalt, Portobello	3.025	40.00	60.00	17.00	10.80	3.92	—	7.28	1.00	—	—	Dark bluish grey.
Basalt, Kaikorai	2.875	41.79	58.21	15.01	10.87	3.97	3.29	6.75	1.90	—	—	Bluish grey.
Angitic basalt, south of Mungaroa	—	51.12	48.88	27.79	—	9.74	3.85	9.33	.41	—	—	—
Diorite, Waipero	3.049	55.51	44.49	13.62	10.83	9.65	6.45	4.93	1.03	—	—	—
Trachyte porphyry, Portobello	2.259	3.04	96.96	Trace	—	Trace	—	1.91	—	0	No action	White.
Quartzose trachyte, Governor's Bay, Lyttleton	2.309	4.70	95.30	—	1.21	1.09	Trace	Trace	1.80	5.5	Do.	Black and white.
Trachyte porphyry, Carterbury	2.323 to 2.402	9.80	90.20	3.20	1.80	.98	—	1.56	1.20	6	Do.	Dirty green.
Trachyte, Creighton Vale	—	23.79	76.21	7.20	9.26	2.60	—	2.87	.66	0	Do.	Dull lead grey.
Granite, Anchor Island	2.631	—	74.20	—	1.20	.80	.60	7.60	.20	—	—	Grey.
Granite, Passage Island	2.639	—	68.13	—	6.01	1.90	.10	10.61	.45	—	—	Red.
Spheroidal clinkstone, Ball Hill, Otago	2.631	17.55	82.45	2.08	6.61	1.51	Trace	.99	1.04	6	No action	Bluish grey. Carbonic acid 3.94.
Tuffa, Anderson's Bay, Otago	—	19.49	80.51	7.67	5.94	Trace	.44	1.40	3.95	4	Much affected.	Light grey.

**Diorites.**—This stone occurs at Wairoa Gorge, Nelson, Ballymore Claim, and Diorites. Tararu Creek, Thames.

**Aphanite** occurs as a conglomerate at Dog Island, and elsewhere as a breccia. Aphanite.

**Porphyrites.**—These stones are found at Flagstaff Hill, Water of Leith. Porphyrites.

**Syenites** occur at Dog Island, and the Bluff, and at various localities on the west coast, and in Stewart Island; but the chief supply now available for industrial purposes is at the Bluff. It is hard, compact, and of a uniformly bluish grey tint of great beauty, consequently it is suitable for kerbing, paving, and massive masonry, as well as for monumental and architectural work. Syenites.

In Isthmus Sound a vein occurs of a uniformly grey tint, but it is rather coarse.

A beautiful green syenite occurs at the north head of Nelson Harbour. These localities would be easily accessible for shipment.

## 2. Trachytes.

This group contains many varieties both of composition and texture, but they all, together with the granites, are distinguished from the first group by containing a large proportion of quartz. Trachytes.

At Port Chalmers a fine grey stone occurs. Another kind, a good freestone, is obtained at Harbour Cove, Otago, and Creightonville, Canterbury.

Granular trachytes are obtained from Governor's Bay, Lyttleton.

Trachyte porphyry is found at Tairoa Head, and Moeraki and Portobello, and from Port Chalmers a breccia is obtained, with which the graving dock there is entirely built. All the kerbing in Dunedin is from the quarries of this stone.

Sanadine trachyte is found at Portobello, Otago Harbour.

Phonolite or clinkstone of a columnar character occurs at Bell Hill, and a laminated and spheroidal variety at Blanket Bay.

The gaol and some other old buildings of Dunedin are built of a spheroidal clinkstone, which is of a mottled grey colour, and exceedingly hard and compact. The foundations of buildings in the city are frequently constructed with the same stone, which is eminently suited for the purpose. The stone is probably metamorphosed tuffaceous sandstone.

**Granites.**—Granite is only found as mountain mass at Preservation and Chalky inlets, on the western coast of the South Island, but exists in large veins and blocks in Stewart Island and the whole of the west coast. Granites.

At the first-named localities the granite is of a pinkish tinge with grey spots, and rather coarse in the grain.

The veins and blocks supply a fine grained, beautifully coloured stone, more suitable for architectural and monumental work than the former.

At Seal Island a fine grey granite vein occurs, having a smooth grain.

Granite rocks occur in detached areas in the western part of the provinces of Canterbury and Nelson, but not in accessible situations, being very different in that respect to those occurring on the south-west coast, where they admit of being quarried and shipped with great facility.

A variety with garnets is found at Metal Mountain, west coast.

**Crystalline schists.**—Gneiss of equally good quality with the granite from the south-west coast is to be found in many other inlets, and on the north shore of Milford Sound there is one point where there is an immense accumulation of blocks of a grey variety mottled with crystals of garnet, and of all sizes and shapes, lying as if for shipment. Other localities are "Connecting Arm" and Anchor Harbour. Crystalline schists.

## 3. Limestones.

Limestones.

**Marble.**—The purest form of this series is found in many localities in the South Island; statuary marble occurs among the gneiss and hornblende schists of the west coast, the grain of samples hitherto found are rather coarse, but probably closer grained kinds exist. Marbles.

Granular or crystalline and sub-crystalline limestone of every shade and colour, texture and hardness, occur plentifully, chiefly in the Middle Island.

Extensive masses of the harder compact kinds occur in the lower Mesozoic mica slate series. They are, generally speaking, of a blue colour and unfossiliferous.

One mass or stratum occurs in the slab of the Kakanui range; it is several hundred feet thick, with an outcrop of five miles in length, and is probably the best in the province of Otago.

A large variety of excellent building stones might be obtained from the Horse Range (Shag Valley side), at Twelve Mile Creek on Lake Wakatipu Malvern Hills, Canterbury, and Hokionu Hills, Southland. In the latter province a very fine kind is obtainable, very slightly coloured; it belongs to the tertiary series.

A white granular limestone called the Oamaru stone is worked in extensive quarries in the Oamaru district; it occupies a large tract of the country in the north part of Otago, and has a remarkable uniformity of colour and texture; its weight, wet from the quarry, is 105 lbs. per cubic foot, and when perfectly dry 92 lbs. A considerable quantity has been exported to Melbourne.

The principal buildings of Dunedin are built of this stone, which shows a very fair amount of durability.

At Wairoa, Auckland, there is a good hard close grained stone, light buff colour, mottled with black grains.

The Dun Mountain Company work a hard compact close grained stone of a bluish grey colour on the Maitai River, Nelson, which can be brought to the port by the Dun Mountain Railway.

#### 1. *Parapara Iron and Coal Company, Nelson.*

c. Limestone, occurs in quantity at a considerable distance beneath the outcrop coal measures; intended to be used as a flux in the reduction of the brown hematite ore which is found in great quantities in the district.

#### 3. *Nelson Committee, Nelson.*

c. Marble from Ruatanuka, Golden Bay.

#### 7. *Colonial Museum, Wellington.*

c. Marble from Collingwood, Nelson.

#### 14. *Wilson, W., Christchurch.*

a. White limestone. b. Yellow lime-stone obtainable in block of from 1 to 10 tons.

#### *Earthy Limestone.*

*Freestone.*—A fine limestone of a brown tint occurs near Dunedin at Boat Harbour; it works freely, seems durable, and is said to exist in large quantities and be procurable in moderately sized blocks; it has the disadvantage of not being in an easily accessible situation.

A hard, shelly, and white limestone occurs at Kakanui, and is used in some structures in that locality; it is of a uniform colour and consistency and easily worked, and procurable in large blocks. The supply is unlimited.

Southland possesses a fair stone of this kind.

A valuable limestone occurs on the Otago Peninsula, near Port Chalmers, in two beds, one dark coloured and the other yellow, the last contains a rather large amount of fine grained sand, yellow and black; they burn to pretty good quick lime.

A good stone for lime occurs in the Isle of Scinde, Napier; it is fossiliferous and of upper tertiary series.

At Oamaru a limestone is largely burnt for lime by Mr. D. Hutchinson; it is found in dislocated and concretionary masses intermixed with quantities of worthless rock, which greatly increases the expense of extraction. It is fossiliferous.

A hard very compact grey coloured stone of considerable purity occurs near the Moke Creek copper lodes, and affords the flux required for reducing the ore. It is fossiliferous and of lower tertiary date.

#### *Varieties.*

*Travertine limestone* is found at Dunstan Gorge, Otago; it makes very white lime. It has the usual porosity of this kind of stone.

*Geodic limestone.*—This occurs at Hampden, Otago, and has numerous sparry cavities of crystallized calc spar and the like.

*Cellular limestone* occurs at Nelson. This kind has numerous angular cells or holes.

A limestone breccia occurs at Ruatanuka.

A lithographic limestone is found at Oamaru; it is a very fine grained stone, hard and compact, its fracture is conchoidal. It occurs in concretions in the limestone and not in slabs. The quarry is situated where the upper tertiary strata have undergone alterations by the extension of submarine rocks, probably during the depositions.

Barthy lime-  
stone.

Varieties.

Lithographic  
limestone.

## LIMESTONES in the ORDER of their PURITY.

Character.	Locality.	Specific Gravity.	Carbonate of Lime.	Carbonate of Magnesia.	Soluble Silica.	Oxide of Iron.	Alumina.	Insoluble Matter.	Colour.	Remarks.
Crystalline	Southland	—	88.80	Trace	Trace	—	1.20	1.20	White.	
Sub-crystalline	Canterbury	—	87.80	1.19	"	Trace	.60	1.50	Bluish.	
Fossiliferous	Oamaru, Otago	—	87.01	2.17	.6	Trace	.45	1.20	Light yellow.	*Silica. Fossiliferous, absorbent,
Granular	Tokomairiro, Otago	2.324	86.96	Trace	—	"	.92	3.32*	White	moderately coherent.
Compact	"	2.583	86.76	"	—	"	1.20	4.06†	Light yellow	†Silica. Fossiliferous, very co-
Lithographic	Oamaru	2.667	84.66	"	—	"	Trace	3.09	Rich yellow	herent.
Travertine	"	2.667	86.21	1.23	.16	.27	Trace	3.33	Yellow	Compact.
Compact	"	—	86.18	1.23	Trace	Trace	.40	1.80	Grey and yellow.	Trace of sulphate.
Veined	Nelson	—	86.04	2.53	Trace	Trace	1.20	3.40	Bluish grey.	
Granular	Auckland	—	84.88	.53	Not estimated	Trace	Trace	3.80	Grey.	
	Oamaru	—	84.37	.23	"	Trace	Trace	3.45		
	Oamaru	—	83.43	2.58	.50	Trace	Trace	5.60	Pern.	
	Southland	—	82.40	Trace	Not estimated	Trace	Trace	6.20	Grey	
Shelly	Napier	—	81.80	.60	"	Trace	"	4.43	"	
Compact	Wakatip Lake, Otago	2.702	81.80	2.94	—	Trace	"	6.21	Bluish	Loss, .23.
Closely grained	Kaikoura, Marlborough	—	81.17	2.63	Not estimated	Not estimated	Trace	3.29	Grey	
Compact	Oamaru, Otago	2.698	80.99	2.16	.46	.14	1.54	7.14	White	Loss, .18; tr. chlorides.
Shelly	Southland	—	80.80	Trace	Trace	Trace	Trace	7.14	Pale buff	††Includes alumina.
Granular	Oamaru, Otago	—	80.14	1.7	—	Trace	Trace	3.4		Loss, .78; tr. chlorides.
Compact	Kaikoura, Marlborough	—	80.9	1.5	—	Trace	Trace	16.20	Nearly white.	
	Oamaru, Otago	—	80.9	1.5	—	Trace	Trace	16.20	Dark.	
Conglomerate	Oamaru, Otago	2.583	87.08	Trace	Not estimated	Trace	Trace	16.20	Yellowish.	
Compact	Portobello, Otago	—	84.80	1.70	"	Trace	Trace	16.20	Grey.	
Shelly	"	—	81.10	1.90	"	Trace	Trace	16.20		
Compact	Napier	—	80.04	1.50	"	Trace	Trace	16.20		
	Kaikoura Mountains, Marl-	—	80.04	1.50	—	Trace	Trace	16.20		
	borough,	—	80.04	1.50	—	Trace	Trace	16.20		
Impure silicious	Kawau, Auckland	—	84.90	1.50	—	Trace	Trace	16.20		Carbonic acid, 28.9; water and loss, 4.22; tr. sul. lime.
	Near Waimatua, Otago	2.507	87.06	.53	.63	.53	.60	23.53		Silicious sand and clay. Soluble alkalis in acid .80.
Dolomite	Taranaki	—	86.68	15.53	1.90	15.24	.92	39.34	Bluish grey	

Limestones in order of purity.

## (4.) Sandstones (Freestone).

## Sandstones.

Sandstones are very plentiful throughout the islands, and are very varied in hue.

The different kinds may be classed under the following heads:—

A. Siliceous sandstones, in which the cementing paste is a silicious infiltration.

B. Calcareous sandstone, having carbonate of lime for its cohesive power.

C. Argillaceous sandstones, or claystones, in which clay replaces either of the above substances.

## Siliceous.

A. The true siliceous sandstones are found at the base of the tertiary and in the upper secondary formations, where they are associated with beds of coal.

The province of Otago has an extensive development of this kind of stone in the Horse Range and South of the Molyneux River, and throughout the central districts of the Middle Island, capable of producing the most valuable kinds of building material. In Otago, at Moeraki, Saddle Hill, Mount Pleasant, Waikava, and Arden Bay, in Canterbury, at Governor's Bay, in Auckland, at Bay of Islands, produce stones of this class.

In the North Island, Mungaroa produces a good stone.

The Waikato district, and the range of mountains from Hawke's Bay to East Cape, have large tracts where quarries of good stone might be worked.

## Calcareous.

B. Calcareous sandstones.—These are confined to the upper tertiary rocks, and are variable and concretionary.

In the South Island, the valley of the Wairau, in the neighbourhood of Dunedin, Waikava, and Oamaru yield many varieties of compact hard stone suitable for building.

From Caversham, in the vicinity of Dunedin, a well-known hard and compact stone is worked, bluish-grey or yellow in colour; its texture is remarkably uniform, but it is not durable. Other places in Otago are Pleasant River, Cornish Mount, Waikouaiti, Waikava, Kaikorai Valley, Hawkesbury, and in Auckland at Motupipi.

In the North Island there are much more extensive districts where this stone occurs. The greater part of the province of Wellington, and also of Hawke's Bay, being upper tertiary age, in which this stone occurs.

## Argillaceous.

C. Argillaceous sandstones or mudstones, claystones.—These, like the last kind, are found only in the upper tertiary beds, and are as variable; occur at Saddle Back, Moeraki, Mount Pleasant, and at Anderson's Bay.

## SELECTED ANALYSES OF SANDSTONE to illustrate their GENERAL COMPOSITION.

NAME.	Specific Gravity, or ozs. in cubic feet.	Porosity, 0-10.	Essential Constituents.			Impurities.			Water of Constitution and Hygroscopic.	Colour.
			True Sand.	Carbonates lime and magnesia.	Insoluble Clay.	Soluble Clay.	Oxide of Iron.	Alkaline Chlorides.		
A.—SILICEOUS SANDSTONES.										
1. Moeraki - - - -	2.490	5	82.5	0.0	9.0	3.5	2.0	0.56	2.99	Rusty brown.
2. Waikava - - - -	2.677	2	80.1	5.8	0.0	7.4	4.6	0.0	2.51	Dark greenish grey
3. Arden Bay - - - -	2.445	4	70.8	0.0	25.4	0.0	1.8	1.3	2.28	Reddish white.
B.—CLAY STONES.										
4. Saddle Hill - - -	2.240	4	56.0	0.0	28.5	10.8	1.7	0.7	4.05	Yellow.
5. Moeraki - - - -	2.425	3	52.7	0.0	41.5	1.8	Traces	1.0	4.14	Grey.
6. Mount Pleasant - -	2.376	3	37.8	0.0	41.8	14.9	2.6	0.4	4.80	Greenish grey.
C.—CALCAREOUS SANDSTONES.										
7. Kaikorai (a) - - -	2.170	6	21.0	42.1	25.9	3.4	1.7	0.0	5.9	Buff yellow.
8. Caversham - - - -	2.200	4	24.4	53.0	17.6	1.5	1.4	0.2	2.0	Bluish grey.
9. Hawkesbury - - -	2.597	3	25.0	51.7	17.9	3.0	0.8	Traces	1.9	" "
10. Kaikorai (b) - - -	2.532	2	28.0	62.8	1.0	4.5	1.8	—	0.6	Greyish yellow.
11. " (c) - - - -	2.519	1	27.6	63.5	—	2.4	0.8	—	4.2	" "
12. Pleasant River - -	2.307	1	29.5	64.1	—	1.2	0.8	—	—	Pure grey. "

## SELECTED ANALYSES of SANDSTONE—continued.

Silicious Sandstone. Locality.	Specific Gravity.	Porosity, 0-10.	Soluble in Acid.	Insoluble in Acid.	Nature and Amount of Substance soluble in Acid.							Soluble Salts.	Action of Glauber's Salt.	Colour.
					Soluble Silica.	Alumina.	Oxide of Iron.	Lime.	Magnesia.	Water of Constitution.	Alkalies.			
Arden Bay, Upper Harbour, Otago.	2.445	4	3.72	96.28	Trace	.99	.78	.28	.29	.89	.77	1.00	—	Light colour.
Governor's Bay, Canterbury	—	1	4.05	95.95	Trace	Trace	2.20	4.50	—	.80	.60	.60	—	Mottled yellow.
Moeraki, Otago	2.425	8	5.77	94.23	—	1.77	Trace	Trace	Trace	2.77	1.23	.99	—	Light grey.
Moeraki, Trotter's Creek, Otago.	2.490	5	8.41	91.56	—	2.72	2.00	.56	—	2.99	.17	Trace	—	Rusty red.
Bay of Islands, Auckland -	—	1	10.50	89.50	—	4.74	Trace	1.24	.63	.19	3.70	—	—	White.
Wangarei, Auckland	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Calcareous Sandstones. Locality.	Specific Gravity.	Porosity, 0-10.	Soluble in Acid.	Insoluble in Acid.	Composition of part soluble in Acid.						Colour.
					Soluble Salts.	Alumina.	Iron Oxide.	Carbonate of Lime.	Carbonate of Magnesia.	Water and Loss.	
Dunedin, vicinity of Otago	2.540	7	72.85	27.65	.72	1.79	.79	68.51	Trace	.54	Grey.
Canterbury	2.288	—	69.99	30.02	.80	2.60	Trace	65.98	.63	—	Light buff.
Oyster Point, Otago Harbour	—	—	69.98	30.01	1.00	3.00	—	64.60	1.16	.22	Dark grey.
Pleasant River, Otago	2.307	—	70.46	29.53	.63	.60	.83	63.08	1.10	4.22	—
Cornish Mount, Waikouaiti, Otago	—	—	68.60	31.40	—	2.83		65.77	Trace	—	Dark grey.
Waibemo	—	—	65.20	34.80	—	1.80	1.20	61.60	.28	.32	Light yellow.
Kaikorai Valley	—	—	69.81	30.19	1.57	2.90		60.86	1.99	.71	Dark grey.
Sibbald's Quarry, Caversham, Otago.	2.200	—	56.36	43.64	—	2.92		51.22	1.56	2.66	Greenish grey.
Hawkesbury, Otago	—	—	57.06	42.94	.70	2.94	.90	50.05	1.70	.77	Dark grey.
Mount Hackett, Basalt, Otago	—	—	47.80	52.20	—	5.20		41.20	Trace	1.40	—
Kaikorai Quarry	2.170	—	53.20	46.80	3.40	1.75	Trace	40.45	1.70	5.90	Pale yellow.
Auckland	—	—	45.40	54.60	—	4.40		37.60	2.10	1.30	Red and black.
Motupipi, Auckland	—	—	35.10	64.80	—	4.21		30.27	.72	—	Light green.
Moeraki, Otago	—	—	32.20	67.80	—	Trace	4.20	20.40	2.20	5.40	Red and white.

## CEMENT.

Natural cement stones or septaria occur in the lower part of the Marine tertiary series, and in some cases are quite equal in quality to those which are burnt for the manufacture of hydraulic cement in Europe. The cement hitherto used so largely in New Zealand has been imported, but with the great resources that the colony possesses in the raw material for the manufacture, this will probably not be long continued.

In the following Table, Nos. 1 and 3 are analyses of the whole nodule, while Nos. 2 and 4 are without the calcareous veins. Those from Moeraki are very hard and compact, colour mottled grey, specific gravity 2.655, hygroscopic water 60 per cent. at time of analysis. Those from Amuri are similar in character, Septaria used in England and France for manufacture into Roman cement are added for the sake of comparison.

Obtained.	New Zealand.				England.	France.
	Moeraki.		Amuri.		Sheppey.	Boulogne.
	1	2	3	4		
Carb. of Lime - -	72.4	50.8	68.6	54.9	69.0	63.9
Carb. of Magnesia -	.8	—	1.7	1.5	—	—
Alumina and Iron Oxides	8.7	7.6	6.5	6.4	10.5	12.3
Soluble Silica - -	.8	—	1.0	1.0	} 18.0	15.0
Sand and Clay - -	17.8	41.6	31.2	31.9		
Water - - - -	.6	—	1.1	1.2	1.3	.6

Materials for  
Portland cement.

The manufacture of Portland cement might be made an important industry in New Zealand, excellent lime and non-ferruginous clay being obtainable.

The Italian pozzuolano might be imitated also, as there are extensive deposits of volcanic tufas occurring in the North and Middle Island. Those volcanic sands would require then to be ground up with an admixture of lime, and making, when correctly proportioned, an excellent hydraulic mortar.

#### BRICKS.

Materials for  
bricks.

The materials for brickmaking are plentiful throughout the colony. The clays are admirably adapted for the manufacture of the best kinds, and when it is properly weathered and tempered by mixing the clay into a perfectly homogeneous mass, and thoroughly burnt, would equal any of British manufacture.

#### POTTERY.

Pottery works.

The success of the pottery works that have been established at Tokomairiro, has proved the adaptability of the fire and pottery clays of the colony for the best kinds of fire bricks, drain pipes, chimney pots, tiles, and all kinds of pottery, porcelain, and terra cotta goods.

Messrs. Kennedy Bros. exhibit some fireclays from Nelson; porcelain clay and potters clay are also exhibited by the Nelson Committee.

#### 3.—Nelson Committee.

Porcelain and  
pottery clays.

d. Porcelain clays from Pakawan, and clays from Buitanuka, Golden Bay, and Pakawan.

#### 6.—Taranaki Committee.

c. Potter's clays from Urenui.

#### 8.—Kennedy Brothers, Nelson.

Fireclays.

b. Raw and ground fireclay.

Fireclay from a seam 8 feet thick underlying the coal at the Brunner Mine.

Fireclay same as last, ground ready for brickmaking, or other fire goods, is sold at 60s. per ton at Greymouth.

Fire bricks manufactured at the Company's works at the Brunner Mine, value 6l. to 7l. per 1,000 at Greymouth.

## MINERAL EXPORTS from 1853 to 1875, inclusive.

Year.	Coal.		Copper.		Iron.		Chrome Ore.		Silver.		Gold.	
	Amount.	Value.	Amount.	Value.	Amount.	Value.	Amount.	Value.	Amount.	Value.	Amount.	Value.
	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Oz.	£	Oz.	£
1853	41	114	170	1,750	18	254	—	—	—	—	—	—
1854	—	—	302	3,450	9½	137	—	—	—	—	—	—
1855	94	266	140½	3,900	1½	20	—	—	—	—	—	—
1856	—	—	514	11,418	65½	520	—	—	—	—	—	—
1857	3	9	1½	70	—	—	—	—	—	—	10,297	39,904
1858	2	4	351½	5,000	—	—	3	25	—	—	18,533	52,443
1859	—	—	245	2,605	—	—	8	120	—	—	7,336	28,427
1860	1	2	137	1,590	—	—	116	1,440	—	—	4,538	17,585
1861	—	—	110	1,300	—	—	52	520	—	—	194,234	752,657
1862	—	—	51	1,024	—	—	3,483	24,719	—	—	410,862	1,591,859
1863	—	—	—	—	—	—	595	4,818	—	—	628,046	2,432,479
1864	—	—	—	—	105	52	768	4,910	—	—	479,914	1,855,830
1865	—	—	—	—	—	—	—	—	—	—	574,574	2,262,639
1866	261	400	—	—	—	—	231	1,315	—	—	735,376	2,897,412
1867	973	1,228	246	2,700	—	—	—	—	—	—	686,783	2,734,276
1868	1,027	1,210	84	977	7	80	—	—	—	—	637,474	2,462,783
1869	756	800	7	179	1	3	—	—	11,063	2,998	614,231	2,362,995
1870	1,672	1,508	7	120	—	—	—	—	37,123	11,380	544,857	2,163,910
1871	1,695	1,612	—	—	—	—	—	—	80,272	23,145	730,023	2,738,368
1872	990	855	—	—	—	—	—	—	37,064	9,910	446,370	1,730,992
1873	724	655	—	—	—	—	—	—	36,187	9,850	505,337	1,937,425
1874	1,463	1,363	—	—	—	—	—	—	40,566	10,380	376,388	1,505,351
1875	3,385	3,129	—	—	—	—	—	—	29,065	7,560	355,322	1,407,799

Approximate return for period prior to 1853 - - 2,400 tons 70,000£.

## VI.—PRODUCE AND INDUSTRIES.

Cl. 202,602. *Paints, Dyes, and Tanning Barks.*

An excellent paint is manufactured from a hydrous hematite ore obtained in large quantities from Parapara, being a pure peroxide of iron; it is the best preservative for that metal. Wood coated with this paint is comparatively un-inflammable; it is therefore much used in painting shingled roofs. Value, 25£. per ton. Paints, pigments, dyes, and varnishes.

Dep. II. 3. *Louisson, T. B., Nelson.*

Paint made from hematite ore.

4. *Johnstone Brothers, Nelson.*

Umber and red pigments made from hematite ore.

4a. *Felton & Co.*

Eight samples of varnish made from Kauri gum.

A number of the native forest trees and plants furnish good dyes from their bark. The natives were acquainted with most of these, and dyed their flax mats and baskets with them.

A black dye can be made from the bark of the hinan (*eleocarpus dentatus*), and by adding a rust of iron an excellent non-corrosive ink is obtained.

Brown and red dyes are obtained from the barks of the towai (*weinmannia racemosa*), a red dye from that of the atanhero (*rhabdotheramnus solandri*). The native mode of producing this is by first bruising and boiling the bark for a short time, and when cold, the flax to be dyed is taken out and steeped thoroughly in red swamp mud, rich in peroxide of iron, then removed and dried in the sun.

The towai is a forest tree abundant in many parts of New Zealand. The bark has been successfully used as a tanning agent. It is also used by the Maoris in producing their red and brown colours. The dye obtained from this gives a very fast class of shades upon cotton; it can be sold at the same price as gambier and catechu; also sample of phormium dyed therewith by the Maoris. This extract is more astringent than that of the hinan, and needs only to be introduced to be accepted by tanners.

Dep. II. 5. *Grayling, W. S., Taranaki.*Extract of towai (*weinmannia racemosa*).Extract of hinan (*eleocarpus dentatus*).Dep. II. 43. *Taranaki Committee.*b. Bark of the atanhero (*rhabdothamnus solandri*), produces a red dye.Bark of the pukatea (*atherosperma* Novæ-Zelandiæ); the inner bark contains a powerful anodyne earth used by the Maoris as a mordant for dyes.Dep. II. 46. *Grayling, W. S., Taranaki.*

Bark of hinan.

Blue earth used by the Maoris mixed with shark oil, a deep and brilliant blue paint; it is supposed to be vivianite or a phosphate of iron.

Tanning  
materials.*Tanning Materials.*Dep. II. 42. *Westland Committee.*Specimens of the towai or red birch (*fagus menziesii*), suitable for tanning purposes; also a sample of the extract fluid.47. *Colonial Museum, Wellington.*

## Tan barks native to New Zealand.

Name.	Native Name.	Percentage of Tannin.
Bark of <i>phyllocladus trichamanoides</i> - -	Kiri toa toa - -	23·2
„ <i>elæocarpus dentatus</i> - - -	Kiri hinan - -	21·8
„ <i>coraria ruscifolia</i> - - -	Tutu - -	16·8
„ <i>eugenia maire</i> - - -	Whan hako - -	16·7
„ <i>Weinmannia racemosa</i> - - -	Tawheri - -	12·7
„ <i>elæocarpus hookerianus</i> - - -	Pokaho - -	9·8
Wood of <i>fuchsia excorticata</i> - - -	Kotukutuku - -	5·3
Bark of <i>knightia excelsa</i> - - -	Rewa-rewa - -	2·7
„ <i>mysine urvillei</i> - - -	Mapan - -	1·4
„ <i>hoheria populnea</i> var. <i>angustifolia</i> -	—	—
„ <i>herneola auriculæ-judee</i> , exported largely to China by Chinese emigrants.	—	—
Leaves of <i>celmisia coriacea</i> (tikapu), from the hills of the South Island.	—	—

## Cl. 667. WOOL.

## Wools.

Wool is undoubtedly one of the most important productions of New Zealand, and its value in export is only second in value to that of gold.

Combing wools.  
Clothing wools.

Wool is divided into two classes, combing wool and clothing wool; from which are produced the two leading kinds of manufacture in the cloth trade, viz., worsted and woollen goods.

Long stapled  
wools.

The first comprises the long stapled wools grown by the Lincoln, Leicester, Cotswold, and Romney Marsh breeds of English sheep.

They are required for worsted goods, and being combed for bombazines, camlet, &amp;c. This is a class of wool for the production of which the soil and climate of New Zealand are very suitable. The long woolled sheep of Great Britain improve by the change; the length of the wool is increased, and all its valuable properties preserved, owing doubtless to the genial climate and absence of exposure to the extremes of an English temperature.

## Leicester breed.

The Leicester breed has received great attention in New Zealand, and is the favourite with the Auckland sheep farmers.

The Cotswold is a wool very similar to the Leicester, but of a somewhat deeper and harsher character, and lacks the "lustre" so much in demand for certain classes of manufactured goods. The Cotswold appears quite as much in favour with the New Zealand breeder as the Leicester, and probably its habits and character are more generally adapted to the climate of the South Island and the mountain pastures of the colony, than any other long woolled sheep. The Cotswold bears exposure better than the Lincoln or Leicester; will live and thrive on poor land, and come to more weight than any other breed, often reaching 80 lbs. a quarter. Cotswold.

The value of this breed as a cross with either Leicester or short woolled sheep cannot be too much spoken of, and the favour in which crosses with the Cotswold are held, is a sufficient proof of their excellence. Romney Marsh.

The Romney Marsh partakes in a measure of the qualities of the Leicester and Lincoln, being a soft, rich, and good handling wool, rather finer in quality than the Leicester, and having the glossy or "lustre" appearance of the Lincoln. Wool of this description is much in demand for certain fabrics, and is much sought after in the French markets. Cheviot.

The Cheviot is a wool that has grown into considerable popularity of late years, and is largely used in the worsted manufacture. It is a small fine-haired wool, of medium length and moderate weight of fleece.

The varieties of fabrics manufactured from these long staple wools are almost innumerable, and are perpetually varying according to the changes of fashion, though there are certain fixed kinds which may be interesting to mention; viz., *Says*, which is used for clerical and academical vestments, *Serge*, *Satteens*, light woven cloths for ladies dresses; *Reps* are heavier, and from the method of weaving have a transverse ribbed appearance; *Cords*, like the last, but with longitudinal ribs. *Moreens*, watered cloths. *Merinos*, finely woven cloths, originally made from the fine Spanish wool called merino. *Paramattas*, fine cloths originally made from the paramatta wool with silk warps, though now woollen. *Camlets*, thin plain-woven cloths. *Damasks*, *Shalloon*, and when made with cotton warps, producing crapes, coburgs, tammies, delaines, lasting, and Orleans cloths.

The second kind or clothing wool comprises the short stapled wool grown by the Southdown and Shropshire Down breeds of English sheep, and the Merino (Spanish) sheep, from which are manufactured woollen goods, including broad cloths and fancy kinds. Short stapled wool.

The Southdown is a shortstapled fine-haired close growing wool, used chiefly for clothing purposes. The value of this breed to New Zealand sheepfarmers consists mainly in the improvements which crossing with it impart to the carcase. Some breeders have crossed the Southdown with the Merino, and with cross bred Romney Marsh and Merino. Southdown.

The Shropshire down is a breed which is growing every year into more importance. It produces a wool longer in the staple, and more lustrous than any other down breeds. It has been cultivated in New Zealand to a small extent only. Shropshire down.

The Merino is the most valuable and important breed cultivated in New Zealand, and of sheep of this class the flocks of the colony are chiefly composed; they are of the Australian merino variety, improved through the importation of pure Saxon merino rams from Germany. The excellence of the Merino consist in the unexampled fineness and felting property of its wool, which in fineness and in the number of serrations and curves exceeds that of any other sheep in the world. Fine Saxon merino wool has 2,720 serrations to an inch, Merino wool 2,400, Southdown wool 2,000, and Leicester 1,850. These figures represent the felting properties of the various wools. The Merinos adapt themselves to every change of climate, and thrive and retain, with common care, all their fineness of wool under a burning tropical sun, and in cold mountain regions. Merino.

In New Zealand the length of staple and weight of fleeces have been increased, without any deterioration in the quality of the wool. Increase in length of staple and weight of fleece without deterioration in quality.

Of the fabrics manufactured from these kinds of wool may be mentioned, *Doeskins*, technically called seven harness cloth. *Cassimeres* and *kerseymeres* are four harness cloths, that is, four instead of seven threads in warp and weft, and in the kersymeres the web being subjected to an extra "milling" is rendered more compact. *Sataras*, ribbed cloths, highly dressed, lusted and hot

pressed. *Venetians*, woven as twills. *Meltons*, stout cloths not dressed or finished except by paring. *Beavers*, deer skins, diagonals, or fancy cloths. *Bedford cords*, usually drab coloured ribbed cloths, of great strength and durability. *Tweeds*, which are lightly felted, and are mostly of Scotch manufacture.

Up to the present time the weaving industry in New Zealand has been confined to tweeds, plaiding, and blankets, and various woollen underclothing.

Quantity and Value of Wool exported.			Quantity and Value of Wool exported.		
	lbs.	£		lbs.	£
1853	- - -	66,507	1865	- 19,180,500	1,141,761
1854	- - -	70,108	1866	- 22,810,776	1,354,152
1855	- 1,772,344	93,104	1867	- 27,152,966	1,580,608
1856	- 2,559,618	146,070	1868	- 28,875,163	1,516,548
1857	- 2,648,716	176,579	1869	- 27,765,636	1,871,230
1858	- 3,810,372	254,022	1870	- 37,039,763	1,703,944
1859	- 5,096,751	339,779	1871	- 37,793,734	1,606,144
1860	- 6,665,880	444,392	1872	- 41,886,997	2,537,919
1861	- 7,855,920	523,728	1873	- 41,535,185	2,702,471
1862	- 9,839,265	674,226	1874	- 46,848,735	2,834,695
1863	- 12,585,980	830,495	1875	- 54,401,540	3,398,155
1864	- 16,671,666	1,070,997			

Exhibits and descriptions.

The following specimens were exhibited :—

Dep. VI. 6. *Peter, W. S., Anama, Ashburton, Canterbury.*

Merino wool, male, 12 months old, not previously shorn, first combing in grease. Average weight 6 lbs.; average price of previous clips 1s. 1d. all round, except locks. Sold at Christchurch privately.

7. *Bealey, Samuel, Canterbury.*

Ten fleeces, second cross from Merino ewe by Romney Marsh or Kent ram; ewes and wethers 14 months old, not previously shorn, first combing in grease. Average weight 10·3 lbs.; average price of previous clips in London 1s. 3d. in grease and 1s. 10d. to 2s. 6d. cold water washed.

8. *A. W. Rutherford, Mendip Hill, Amuri, Nelson.*

Merino ewe hoggets, 14 months old, not previously shorn, dipped, in February 1875, in lime and sulphur for ticks, greasy super first combing. Average price of previous clips in London, 1873, greasy fleece 1s. 4d. to 1s. 5d.; 1874, greasy fleece, 1s. 5d. to 1s. 6d.

9. *Anstey, G. A., Canterbury.*

Merino, bred by John Hartland of Mount Parnassus, Amuri, Nelson, four year old rams; date of previous shearing 25th November 1874, — months growth, dipped, in November 1874, in lime and sulphur, first combing in grease. Average price of previous clips in London, 1874, portion of clips (without rams) 1s. 1½d.; 1875 portion of clip (without rams) 1s. 3½d.

10. *Mason, J. Cathcart, Corwar, South Rakaia, Canterbury.*

Merino, six tooth wethers, 12 months' growth, greasy. Average price of previous clips in London 9d. to 1s. 5d.

Lincoln, full mouth ewes, bred by Thomas Kirkham of Baresthorpe, and Dudding of Pantin, Lincolnshire, England, imported in March 1874 from England, being then four tooth 12 months' growth, in grease.

Cross, between Lincoln and Merino, two tooth ewes, 12 months' growth. Average price of previous clips in London 1s. 1d. to 1s. 4d. in grease.

11. *Hall, John, Hororata, Canterbury.*

Merino wool.

12. *Rickman, F. M., Rangiora, Canterbury.*

Romney Marsh wool.

13. *Braithwaite, Arthur, Hull, Wellington.*

Romney Marsh wool.

## Cl. 666. PHORMIUM TENAX.

## The New Zealand Hemp.

The history of what is termed the flax industry in New Zealand affords a remarkable instance of the difficulty experienced in developing the natural resources of a country if the commodities to be disposed of have not a previously established market value.

History of flax industry.

When the colonists first arrived in New Zealand, the valuable qualities of the phormium fibre were well known, as it was in constant use by the natives, and a very considerable trade in the article existed as early as 1828, when the islands were only visited by whalers and Sydney traders, 50,000*l.* worth of the fibre being sold in Sydney alone between 1828 and 1832. At Grimsby, in Lincolnshire, a manufactory was also established in the latter year for the production of articles from the New Zealand fibre, which failed from some unexplained cause; notwithstanding that, the results were not considered at the time unsatisfactory. From 1853 to 1860 the average annual value of the fibre exported was nearly 2,500*l.*, reaching as high as 5,500*l.* in 1855, but up to this time the only fibre exported was that prepared by native labour, no machinery of any kind being employed in producing the exported article. In 1860, therefore, when the native disturbances affected the Waikato, and other interior districts in the North Island, the preparation was confined to the native tribes north of Auckland, so that the average export was only 150*l.* per annum. Attention was then directed towards the contrivance of machinery with the aid of which the fibre could be profitably extracted by European labour. In 1861 the increasing demand for white rope, and the limited quantity of manilla, which fibre depends for its production on native manual labour in the Philippine islands, led to a rise in its value from 21*l.* to 56*l.* per ton, and even to 76*l.* per ton in America during the late civil war. These high prices stimulated the endeavour to introduce phormium fibre to compete with manilla, and several machines were invented for rapidly producing the fibre from the green leaf. With these machines the export trade again increased, so that from 1866 to 1871 the yearly average was valued at 56,000*l.* This sudden revival of the trade led many to embark in it who were unacquainted, not only with this new form of manufacture, but unaccustomed to any kind of business that required special mechanical skill and careful elaboration of the details of management.

Phormium used by natives.

Average value of exports from 1853 to 1860.

Commissioners were appointed in 1869 and 1870 to investigate and report on the manufacture and cultivation of the plant and particular requirements of the market.

Appointment of Commission to report on cultivation.

During the last year the term flax has been changed to hemp, with great advantage to the position which the fibre holds in the broker's sale rooms; but the fibre can be prepared so as to mix advantageously with true linum flax in the manufacture of textile fabrics, and the shortness of the ultimate fibre is not an insuperable obstacle even to its being spun into unmixed yarns. It will, therefore, in all probability, be necessary to adopt two names for the fibre to indicate the purpose for which it has been specially prepared, such, for instance, as phormium hemp and phormium flax. Samples of serge sheeting, canvas sacking, and other varieties of cloth, from unmixed phormium fibre have been manufactured in Arbroath and sent out to the colony, and also samples of a very superior kind of canvas made from an admixture of phormium with Riga flax. The fibre used in these experimental manufactures was prepared by Mr. C. Thorne by the use of alkaline solutions, and it is stated that such fibre would find a ready market in large quantities at from 60*l.* to 90*l.* per ton. Whether this would be as profitable an application of the fibre as the production of hemp is, however, not yet established.

Table of export  
of Phormium  
from 1865 to 1876.

TABLE showing the VALUE of PHORMIUM Exported from NEW ZEALAND up to the end of the YEAR 1864, and the QUANTITY and VALUE of each subsequent Year to 30th DECEMBER 1875.

Year.	Quantity.		Estimated Value.	
	Tons. Cwts.	Estimated No. of Bales.	Per Ton.	Total.
1865	2 14	17	£ s. d. 27 10 0	£ 75
1866	11 3	67	89 0 0	995
1867	126 15	760	33 5 0	4,256
1868	534 0	3,204	15 5 0	8,137
1869	2,027 0	12,162	22 6 0	45,245
1870	5,470 0	32,820	24 2 0	132,578
1871	4,248 10	25,491	21 6 6	90,611
1872	3,987 0	—	24 18 1 $\frac{1}{4}$	99,405
1873	6,454 10	—	22 4 1	143,799
1874	2,039 0	—	13 11 7	37,690
1875	639 0	—	18 7 6	11,742
Exported prior to 1865				574,538
Total Value - - - £				17,909
				592,442

Exhibits and  
description.

## Dep. II.

### 8. Government of New Zealand.

Specimens of fabrics made from phormium tenax.

#### 16. Moyle Edward, Taranaki.

Cord made from phormium, 3 samples.

#### 17. Bevan Thomas, Otaki, Wellington.

One hank of native dressed fibre. The Maoris only use a portion of the fibre on one side of the leaf, the leaves being selected with great care. They scrape the leaf with a mussel shell or a piece of hoop iron. The fibre is then soaked in cold water and dried.

Rope manufactured from native dressed fibre, two fish lines, horse halter, lead line, twine, double twine.

#### 18. Bevan and Sons, Wellington.

Assortment of cords and twines. Manufactured from native-dressed fibre by exhibitors.

#### 19. Kinross and Company, Hawke Bay.

Nine exhibits of cordage and twines, made from Maori-dressed fibre.

#### 20. Grant and Company, Otago.

Assortment of cordage.—Manufactured by exhibitors.

#### 21. Auckland Patent Steam Rope Company, Auckland.

1 coil, 6-inch 4 strand white rope.

1 " 6 " 4 " oiled "

2 coils, 5 " 4 " " "

2 " 4 " 4 " " "

2 " 3 $\frac{1}{2}$  " 4 " " "

2 " 3 " 3 " " "

2 " 2 $\frac{1}{2}$  " 3 " " "

1 coil of white rope.

#### 22. Canterbury Flax Association, Christchurch, Canterbury.

Assortment of cordage, tarred and untarred. 7 exhibits.

23. *T. Lennon, Christchurch, Canterbury.*

Assortment of cordage, ropes, and wines. Manufactured by exhibitor.

24. *W. Cook, Nelson.*

12 exhibits, all manufactured by exhibitor, viz. :—2 hearth-rugs, 2 parlour mats, 2 bedroom mats, 4 hall mats, 1 railway mat, and 1 carriage mat.

25. *Simons and Malcolm, Nelson.*

2 door mats.

26. *Colonial Museum, Wellington.*

10 Maori mats, viz. :—

- 1 flax and kaka feathers.
- 1 flax and pigeon feathers (*Kereru*).
- 1 flax and kiwi feathers (*Eheruheru*).
- 3 parawai mats.
- 1 piu piu.
- 1 korowai.
- 1 pota.
- 1 pureke.

Shoes, apron, bag, dyed fibre, of Maori manufacture.

26a. *Tarahora.*

1 fancy mat, Maori manufacture.

26b. 1. *Charles Chinnery, Addington, Canterbury.*

1 bale, machine dressed, washed, bleached, scutched, and hackled. Valued by exhibitor at 30l. per ton free on board.

26c. 2. *Taranaki Committee.*

1 bale, machine dressed.

26d. *James Cook, Nelson.*

Mats and matting.

26e. *Mrs. Richard Taylor, Wanganui, Wellington.*

Ornamental satchel and table mat.

Cl. 620. Dep. II., North of Nave ; Dep. VI., East Aisle.

## AGRICULTURAL PRODUCE.

Taking the agricultural produce as an index of the permanent settlement of Flour and grain. the country, the following table shows a most satisfactory progress in this respect.

QUANTITY AND TOTAL VALUE OF FLOUR and GRAIN, &amp;c. EXPORTED.

Exports from  
1864 to 1875.

—	Flour.	Bran and Sharps.	Grain.				Total Value.
			Wheat.	Barley.	Malt.	Oats.	
	Tons.	Tons.	Bushels.	Bushels.	Bushels.	Bushels.	£
1864	—	—	—	—	—	3,540	735
1865	1	—	3,473	2,390	—	19,584	6,101
1866	24	—	4,760	392	—	27,440	7,371
1867	971½	18½	131,915	9,258	—	17,038	36,060
1868	153½	862½	94,297	51,308	2,360	464,633	123,344
1869	440	1,174	81,758	92,537	3,564	342,075	105,885
1870	737½	807	387,185	114,915	12,094	340,703	152,668
1871	928½	700	271,941	156,213	10,569	594,149	179,469
1872	502½	471½	477,455	11,537	3,537	565,901	188,113
1873	964½	48	536,677	247	1,470	46,437	148,587
1874	2,210½	85	938,514	90,081	3,423	135,959	319,018
1875	636	121½	548,065	91,622	6,885	630,325	239,796

Exhibits and  
description.

The following were exhibited :—

GRAIN AND AGRICULTURAL PRODUCE.

Dep. II., North of Nave, No. 51 ; Dep. VI., East Aisle, No. 1.

*E. H. Banks, Christchurch, Canterbury.*

1. Rye, grown in Ashburton district. Soil, fine black loam, shingle bottom, formerly covered with native flax (*Phormium*) ; sown in May ; 2 bushels of 60 lbs. per acre ; crop average, 40 bushels per acre ; value, 4s. per bushel.

2. Malt, made in Christchurch, from barley grown in Selwyn district. Soil, rich black loam, formerly laid down with English grasses ; sown in September ; 2½ bushels of 50 lbs. per acre ; value 8s. per bushel of 40 lbs.

3. Barley, grown in Leeston district. Soil, light porous, made rich by sheep feeding upon turnips and mangolds, and by artificial drainage ; sown in October ; 2 bushels of 50 lbs. per acre ; crop average, 45 bushels ; value, 5s. per bushel.

4. Broad beans, grown in Lincoln district. Soil, old flax (*Phormium*) swamp, with stiff clay subsoil ; sown in July ; 1½ bushels of 60 lbs. per acre ; crop average, 30 bushels ; value, 4s. per bushel.

5. Canadian oats, grown in Rolleston district. Soil, very light, formerly a sheep run ; sown in August. Two bushels of 40 lbs. per acre ; crop average, 45 bushels ; value 2s. 10d. per bushel.

6. Black Tartarian oats, grown in Ashburton district ; soils, alternate down and flax (*Phormium*) swamp, at present an extensive sheep-breeding station ; sown in August ; 2½ bushels of 40 lbs. per acre ; crop in 1875 about 30,000 bushels, three-fourths of which are crushed and consumed on the station, feeding long wool sheep and horses. Value, 2s. 6d. per bushel.

7. Horse beans, grown in Kaiāpoi district. Soil, very heavy swamp land, strong clay bottom, covered by a silt deposit caused by a periodical overflow of the Waimakariri river ; sown in July ; 2 bushels of 60 lbs. per acre ; crop average, 35 bushels ; value, 5s. per bushel.

8. Field peas, grown in Prebbleton district. Soil, light loam, shingle bottom ; sown in July ; 2 bushels of 60 lbs. per acre ; crop average, 40 bushels ; value, 4s. 6d. per bushel.

9. Chaff from oaten hay, grown in Heathcote district, cut by a Buncle (of Melbourne) patent cutter, screen and packer combined, packed and pressed ready for shipment to the different gold diggings, in bales of 5 sacks, weighing about 3½ cwt. and measuring 17 feet ; value, 5l. 10s. per ton.

10. Field peas, grown in Templeton district. Soil, very light, well drained, mostly shingle bottom. Sown in July ; 2 bushels of 60 lbs. per acre ; crop average, 30 bushels ; value, 4s. 6d. per bushel.

The above are intended to show the produce of the different districts in the province of Canterbury.

The quantity per acre given in the actual result in these particular cases. The price is what each exhibit would command free on board at Port Lyttelton, in large parcels, nett cash.

11. Twenty-eight samples of grain, &c., a fair average of farmers' delivery at exhibitors' store. All grown within 50 miles of Christchurch. Season, 1875.

12. Four sheaves of prime Tartarian white oats, cut green for fodder.

Dep. 2, No. 52 ; Dep. 6, No. 2.

*W. D. Wood, Christchurch, Canterbury.*

1. 25 lbs. tuscan wheat, weighs 68 lbs. per imperial bushel.

2. 25 lbs. rough chaff wheat, weighs 66 lbs. per imperial bushel.

3. 25 lbs. velvet chaff wheat, weighs 65½ lbs. per imperial bushel.

4. 25 lbs. red chaff wheat, weighs 64½ lbs. per imperial bushel.

5. 50 lbs. of flour.

Dep. 2, No. 53; Dep. 6, No. 3.

*P. Cunningham & Co., Christchurch, Canterbury.*

11 ordinary samples of wheat, grown in the province of Canterbury.

1.  $\frac{1}{2}$  bushel pearl wheat.
2. " Hunter's white wheat.
3. " tuscan "
4. " Hunter's white "
5. " velvet chaff "
6. " red chaff "
7. " purple straw "
8. " velvet chaff "
9. " pearl "
10. " red chaff "
11. " tuscan "

Dep. 2, No. 54; Dep. 6, No. 4.

*John G. Ruddenklau, Addington, Canterbury.*

1 bag Champion white wheat; yield, 45 bushels per acre; value, 4s. 6d. per bushel.

Dep. 2, No. 55.

*Hooper and Dodson, Nelson.*

Hops, picked in March, 1875. Crop off 5 acres, 106 cwt.

Dep. 2, No. 56; Dep. 6, No. 5.

*Robert Wilkins, Christchurch Canterbury.*

Half-bushel of perennial rye grass seed (*Lolium Perenne*), grown by Rev. T. R. Fisher, Selwyn district; soil, sandy loam; yield, 30 bushels per acre; value, 6s. 6d. per bushel of 20 lbs.; weight, 18 lbs. or 36 lbs. per bushel.

Half-bushel cocksfoot seed (*Dactylis glomerata*), grown by executors of Ebenezer Hay at Banks Peninsula. Soil, volcanic hills. The seed was sown on cleared bush land, but not ploughed or cultivated in any way; yield not known; value, 7d. per lb.; weight, 10 lbs. or 20 lbs. per bushel.

## TIMBER AND FOREST TREES.

The general character of the New Zealand woods resembles the growths of Timber and Tasmania and the Continent of Australia, most of them being harder, heavier, forest trees. and more difficult to work than the majority of European and North American timbers. They vary, however, very much among themselves. Many varieties are very durable, and Manuka, Totara, Kauri, Black Birch, Kohwai and Matai, appear to be the most highly esteemed on the whole.

The export trade in timber is shown in the following table:—

Exports from  
1864 to 1875.

VALUE OF TIMBER EXPORTED.

—	Sawn Timber.	Logs, Spars, Pailings, Shingles, and other Timber.	Totals.
	£	£	£
1864 - - -	24,124	646	24,770
1865 - - -	9,680	3,045	12,725
1866 - - -	17,106	7,213	24,319
1867 - - -	14,902	1,208	16,110
1868 - - -	7,878	7,775	15,653
1869 - - -	14,849	7,488	22,337
1870 - - -	11,137	7,186	18,323
1871 - - -	14,200	5,914	20,114
1872 - - -	19,431	7,942	27,373
1873 - - -	22,757	20,880	44,089
1874 - - -	33,410	11,040	44,450
1875 - - -	23,950	16,096	40,046

Order, Coniferæ. Genus *Damnara* (L'Héritier).No. 1.—*Damnara australis* (Lambert).

Woods.  
Exhibits and  
descriptions.

**Kauri.** The Kauri is the finest forest tree in New Zealand, and attains a height of 120–160 feet. The trunk is sometimes 80–100 feet high before branching, and attains a diameter at the base of 10 to 20 feet.

The timber is in high repute for masts and spars, deck and other planking of vessels, and is largely used for house finishings. There is abundant evidence of its durability for more than 50 years in some of the old mission buildings at the Bay of Islands. The buried logs of an ancient Kauri forest near Papa Kura were excavated and found to be in perfectly sound condition, and were used for sleepers on the Auckland and Waikato Railway. On the Thames goldfield it is used for mine props, struts and cap pieces. It forms the bulk of the timber exported from New Zealand.

Some of the largest and soundest Kauri timber has richly mottled shading which appears to be an abnormal growth, due to the bark being entangled in the ligneous growth, causing shaded parts, broad and narrow, according as the timber is cut relative to their planes. It makes a rich and valuable furniture wood.

The Kauri Pine occurs only in the North Island and north of Mercury Bay and grows best near the sea, on wet clay land. The Kauri forests are largely composed of other trees, as well as their characteristic tree.

The turpentine of this tree forms the celebrated Kauri gum, which is extensively excavated from the sites of old forests as far south as Taranaki. In 1871 there were exported 5,053 tons valued at 167,958*l.*, and in 1875 2,230 tons valued at 138,528*l.*

Number 4 in Alphabetical List.

43. *Taranaki Committee.*

No. 33. *Damnaria Australis* var *Mottled Kauri*.

Genus *Libocedrus* (Endl.)No. 2.—*Libocedrus Doniana* (Endl.)

**Kawaka** (Col.) Cypress, Cedar. This noble tree attains a height of 60–100 feet, and 3–5 feet diameter. Wood reddish, fine grained and heavy, used by the Maoris for carving, and said to be excellent for planks and spars; grows in the North Island, being abundant in the forests near the Bay of Islands and North of Auckland.

No. 5 in Alphabetical List.

42. *Westland Committee.*

No. 41. *Libocedrus Doniana*.

No. 3.—*Libocedrus Bidwillii* (Hook).

**Pahautea** (Col.) Cedar. A handsome conical tree 60–80 ft. high, 2–3 ft. diameter. In Otago it produces a dark red free-working timber, rather brittle, chiefly adapted for inside work. Found on the central ranges of the North Island, and common throughout the forests of the South Island, growing at altitudes of from 500 to 4,000 feet. This timber has been used for sleepers on the Otago railways of late years, is largely employed in that district for fencing purposes, and is frequently mistaken for totara. In former years it was believed to be suitable only for inside work.

Genus, *Podocarpus* (L'Héritier).No. 4.—*Podocarpus ferruginea* (Don).

**Miro** (Col.) Called Bastard Black Pine in Otago. A large ornamental and useful timber tree, attains a height of 40–60 feet, trunk 2–3 feet diameter. A useful wood but not so durable as the Matai or true Black Pine-wood; reddish,

close grained and brittle; the cross section of the timber shows the heart wood star shaped and irregular. The timber is generally thought to be unfitted for piles and marine works, except when only partially exposed to the influence of sea water, as shown in the railway embankment at the Bluff Harbour where it is reported to have been durable. Grows in the North and Middle Island and in Otago at altitudes below 1,000 feet.

Number 16 in Alphabetical List.

42. *Westland Committee.*

No. 37. *Podocarpus ferruginea* (Don).

43. *Taranaki Committee.*

No. 26. *Podocarpus ferruginea* (Don).

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No. 5.—*Podocarpus totara* (A. Cum).

**Totara.** A lofty and spreading tree 60 to 120 feet high, 4–10 feet diameter. Wood very durable and clean grained, in appearance like cedar, and works with equal freedom; it is adapted for every kind of carpenters' work. It is used extensively in Wellington for house building and piles for marine wharves and bridges, and railway sleepers, &c.; it is one of the most valuable timbers known. The wood when felled during the growing season resists for a longer time the attacks of teredo worms; it splits freely and is durable as fencing and shingles, Totara post and rail fences are expected to last 40 to 50 years. The Maoris made their largest canoes from this kind of tree, and the palisading of their paha was constructed almost entirely of this wood.

Grows throughout the North and Middle Islands upon both flat and hilly ground; the timber from trees grown on hills is found to be more durable.

No. 25 in Alphabetical List.

42. *Westland Committee.*

No. 35. *Podocarpus totara* (A. Cum).

43. *Taranaki Committee.*

Nos. 28 and 30 *Podocarpus totara* (A. Cum).

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No. 6.—*Podocarpus spicata* (Br.)

**Matai** (Col.) **Mai** (Cum.) Black pine of Otago. A large tree 80 feet high, trunk 2–4 feet diameter. Wood yellowish, close grained and durable, used for a variety of purposes, piles for bridges, wharves, and jetties, bed plates for machinery, millwrights' work, flooring house blocks, railway sleepers and fencing. Bridges in various parts of the colony afford proof of its durability. Mr. Buchanan has described a log of Matai that he found had been exposed for at least 200 years in a dense damp bush in N.E. valley, Dunedin, as proved by its being enfolded by the roots of three large trees, all *Griselinia littoralis* 3 feet 6 inches diameter, with over 300 growth rings. Grows in both North and South Islands at altitudes under 1,500 feet.

Number 15 in Alphabetical List.

42. *Westland Committee.*

No. 36. *Podocarpus spicata*.

43. *Taranaki Committee.*

No. 7. *Podocarpus spicata*.

No. 7.—*Podocarpus dacrydoides* (A. Rich).

**Kahikatea.** White pine. A very fine tree 100–150 feet high, trunk 4 feet diameter. Timber, white and tough, soft, well adapted for indoor work, but will not bear exposure.

Abundant throughout the northern and middle islands; when grown on dry soil it is good for the planks of small boats, but when from swamps it is almost useless. A variety of this tree known as yellow pine is largely sawn in Nelson, and considered to be a durable building timber.

Number 3 in Alphabetical List.

Woods.  
Exhibits and  
description—  
cont.

42. *Westland Committee.*Nos. 38 and 39. *Podocarpus dacrydoides*.43. *Taranaki Committee.*No. 5: *Podocarpus dacrydoides*.

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Genus, *Dacrydium*.No. 8.—*Dacrydium cupressinum* (Soland).

Rimu (Col.) Red pine. Tree, pyramidal with weeping branches, trunk 80 to 130 feet high, and 2-6 feet diameter.

An ornamental and useful timber, wood red, clear grained, heavy and solid, much used for joisting and planking, and general building purposes from Wellington southward. Its chief drawback is in being liable to decay under the influence of wet. It is largely used in the manufacture of furniture, the old wood being handsomely marked like rosewood, but of a lighter brown hue.

The juice of this pine is agreeable to drink, and was manufactured into spruce beer by Captain Cook.

Grows throughout the northern and southern islands, but is of best quality in the south.

No. 19 in Alphabetical List.

41. *Cruickshank, J. D., Upper Hutt.*

Sawing mills, Wellington. Section of trunk of Rimu (*Dacrydium cupressinum*).

42. *Westland Committee.*No. 42. *Dacrydium cupressinum*.43. *Taranaki Committee.*No. 15 and 25. *Dacrydium cupressinum*.

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No. 9.—*Dacrydium colensoi* (Hook).

Monoao (Col.) Yellow pine. A very ornamental tree from 20 to 80 feet high. Wood, light and yellow. It is the most durable timber in New Zealand. Posts of this wood have been in use among the Maoris for several hundred years. Grows in northern and southern islands up to 4,000 feet altitudes. This tree is curious from having two kinds of leaves of the same branches.

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Genus, *Phyllocladus*.No. 10.—*Phyllocladus trichomanoides* (Don).

Tane kaha (Col.) Celery leaved pine. A slender handsome tree, 60 feet high, trunk rarely exceeds 3 feet diameter, wood pale, close grained, and excellent for planks and spars; resists decay in moist positions in a remarkable manner.

Grows in the North Island, especially in the hilly districts.

42. *Westland Committee.*No. 43. *Phyllocladus trichomanoides*.

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No. 11.—*Phyllocladus Alpinus* (Hook).

Toa toa. A small ornamental and densely branched tree, sometimes 2 feet diameter. Bark used for dyeing and making tar. Found in both North and Middle Island.

[Order, Cupuliferae. Genus *Fagus* (Linn).]

No. 12.—*Fagus Mengiesii* (Hook).

Towai. Red birch (from the colour of the bark). A handsome tree 80-100 feet high, trunk 2-3 feet diameter. The timber is chiefly used in the lake

district of the South Island. Durable and adapted for mast making and oar and for cabinet and coopers' work.

Grows in the North Island on the mountain tops, but abundant in the South Island at all altitudes to 3,000 feet.

No. 26 in Alphabetical List.

Woods.  
Exhibits and  
description—  
cont.

#### 42. *Westland Committee.*

No. 46. *Fagus mengiesii* (Hook).

#### No. 13.—*Fagus fusca* (Hook).

Tawai (Bidwell). Towai, Tawhai-ran-nui (Col.) Black birch of Auckland and Otago (from colour of bark). Red birch of Wellington and Nelson (from colour of timber). This is a noble tree from 60–90 feet high, the trunk 5 to 8 feet in diameter. The timber is excessively tough and hard to cut. It is highly valued in Nelson and Wellington as being both strong and durable in all situations.

It is found from Kaitaia in the North Island to Otago in South Island, but often locally absent from extensive districts, and grows at all heights up to 3,000 feet altitudes.

No. 27 in Alphabetical List.

#### 43. *Westland Committee.*

No. 45. *Fagus fusca*.

#### No. 14.—*Fagus solandri* (Hook).

White birch of Nelson and Otago (from colour of bark). Black heart birch of Wellington. A lofty beautiful evergreen tree 100 feet high, trunk 4–5 feet diameter. The heart timber is darker than that of *fagus fusca* and is very durable. This wood is well adapted for fencing and bridge piles; and the bark is useful as a tanning material.

This tree occurs only in the southern part of the North Island, but is abundant in the South Island up to 3–5,000 feet.

### Order, *Mystacæ*.—Genus, *Leptospermum* (Forst.).

#### No. 15.—*Leptospermum scoparium* (Forst.).

Kahikatea. Tea tree of Cook. It is ornamental and useful for fuel and fencing, generally a small scrub but occasionally 20 feet in height in the south.

Abundant throughout the islands.

#### 42. *Westland Committee.*

No. 44. *Leptospermum scoparium* (Forst.).

#### No. 16.—*Leptospermum ercoides* (A. Rich).

Manuka. A small tree 10 to 80 feet high, highly ornamental, more especially when less than 20 years old. The timber can be had 28–30 feet long, and 14 inches diameter at the butt, and 10 inches the small end. The wood is hard and dark coloured, largely used at present for fuel and fencing, axe handles and sheaves of blocks, and formerly by the natives for spears and paddles.

The old timber from its dark coloured markings might be used with advantage in cabinet work, and its great durability might recommend it for many other purposes. Highly valued in Otago for jetty and wharf piles, as it resists the marine worm better than any other timber found in the province. It is extensively used for house piles. The lightest coloured wood, called "White Manuka" is considered the toughest, and forms an excellent substitute for the "hornbeam" in the cogs of large spur wheels. It is abundant, as a scrub and is found usually on the poorer soils, but is rare as a tree in large tracts to the exclusion of other trees.

No. 12 in Alphabetical List.

43. *Taranaki Committee.*Nos. 21, 22. *Leptospermum erecoides*.Genus, *Metrosideros* (Br.)No. 17.—*Metrosideros lucida* (Menzies).

**Rata.** Ironwood. A very ornamental tree, attains a height of 30–60 feet, and a diameter of 2–10 feet. The timber of this tree forms a valuable cabinet wood; it is of a dark red colour, splits freely.

It has been much used for knees and timbers in shipbuilding, and would probably answer well for cogs of spur wheels.

Grows rarely in the North Island, but is abundant in the South Island, especially on the west coast.

No. 17 in Alphabetical List.

No. 18.—*Metrosideros robusta* (A. Cum).

**Rata** (Col.) A tall erect tree 50–60 feet high, diameter of trunk 4 feet, but the descending roots often form a hollow stem 12 feet in diameter. Timber closely resembles the last-named species, and is equally dense and durable, while it can be obtained of much larger dimensions. It is used for shipbuilding, but for this purpose is inferior to the Pohutukawa. On the tramways of the Thames it has been used for sleepers, which are perfectly sound after five years use. Grows in the North Island; usually found in hilly situations from Cape Colville southwards.

42. *Westland Committee.*

No. 34. *Metrosideros robusta*.

43. *Taranaki Committee.*

Nos. 14 and 27. *Metrosideros robusta*.

No. 19.—*Metrosideros tomentosa* (A. Cum).

**Pohutukawa** (Col.) This tree has numerous massive arms; its height is 30–60 feet; trunk 2–4 feet in diameter.

The timber is specially adapted for the purposes of the shipbuilder, and has usually formed the framework of the numerous vessels built in the Northern Provinces. Grows on rocky coasts, and is almost confined to the province of Auckland.

Order, *Meliacæ*. Genus, *Dysoxylum* (Blum).No. 20.—*Dysoxylum spectabile* (Hook).

**Kohe-Kohe** (Col.) A large forest tree 40–50 feet high. Leaves are bitter and used to make a stomachic infusion. Wood tough but splits freely, and is considered durable as piles under sea water. Grows in the North Island.

No. 6 in Alphabetical List.

43. *Taranaki Committee.*

No. 6. *Dysoxylum spectabile*.

Genus, *Eugenia*.No. 21.—*Eugenia maire* (A. Cum).

**Maire-taw-hake** (Col.) A small tree about 40 feet high; trunk 1–2 feet diameter. Timber compact, heavy, and durable. Used for mooring posts and jetty piles on the Waikato, where it has stood well for seven years. It is highly valued for fencing. Common in swampy land in the North Island.

Nos. 8, 9, and 28, in Alphabetical List.

43. *Taranaki Committee.*

Nos. 3, 19, and 20. *Eugenia maire*.

Order, Onagrarieæ. Genus, *Fuchsia* (Linn.).

Woods.  
Exhibits and  
description—  
cont.

No. 22.—*Fuchsia excorticata* (Linn.).

Kohutuhutu (Col.) The fruit is called Konine. A small and ornamental tree 10–30 feet high; trunk sometimes 3 feet in diameter. It appears to furnish a durable timber. House blocks of this which have been in use in Dunedin for more than 20 years are still sound and good. The wood might be used as dye stuff, if rasped up and bled in the usual way, and by mixing iron as a mordant shades of purple may be produced even to a dense black, that makes good writing ink. The juice is astringent and agreeable, yields a medicinal extract. Its fruit is pleasant, and forms the principal food of the wood pigeon.

Grows throughout the islands.

42. *Westland Committee.*

No. 53. *Fuchsia excorticata*.

Order, Araliacæ. Genus, *Panax* (Linn.).

No. 23.—*Panax crassifolium* (Dem and Pland).

Ohoeka (Lindsay). Horoeaka. Ivy tree. An ornamental slender and sparingly branched tree. It has a singularly graceful appearance in the young state, having long reflexed leaves. The wood is close grained and tough. Common in forests throughout the islands.

42. *Westland Committee.*

No. 58. *Panax crassifolium*.

Order, Cornecæ. Genus, *Griselinia* (Forst.).

No. 24.—*Griselinia littoralis* (Raoul).

Puketea (Col.) Broad leaf, Hector. An erect and thickly branched bush tree 50 to 60 feet high; trunk 3–10 feet diameter. Wood splits freely, and is valuable for fencing and in shipbuilding; some portions make handsome veneers. Grows chiefly in the South Island and near the coasts.

Order, Compositæ. Genus, *Olearia* (Mauch.).

No. 25.—*Olearia aviceuniæfolia* (Hook.).

Mike-mike. Yellowwood. An ornamental shrub tree, flowers numerous, trunk 2 feet diameter. Wood close grained, with yellow markings, which render it desirable for cabinet work; wood good for veneers. Occurs in South Island.

42. *Westland Committee.*

No. 61. *Olearia aviceuniæfolia*.

No. 26.—*Olearia nitida*.

An ornamental shrub tree, 20 feet high and 2 feet diameter. Wood close grained with yellow markings, useful for cabinet work. Found in the mountainous region of the North Island and throughout the South Island.

No. 27.—*Olearia Cunninghamii*.

An ornamental shrub tree, 12–20 feet high, with very showy flowers. Found abundantly on west coast of South Island, and not uncommon in North Island.

Woods.  
Exhibits and  
description—  
cont.

Order, Ericaceæ. Genus, *Dacrophyllum* (Lab.)

No. 28.—*Dacrophyllum longifolium* (Br.)

An ornamental shrub tree with long grassy leaves. Wood is white, marked with satin-like specks, and is adapted for cabinet work. Grows in South Island and in Lord Auckland's group and Campbell's Island; none of the South Island specimens are as large in the foliage as those in Auckland Islands. The tree in the vicinity of Dunedin attains a diameter of 10 to 12 inches.

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Order, Verbenaceæ. Genus, *Vitex*.

No. 29.—*Vitex littoralis* (A. Cum).

Puriri (Col.) A large tree, 50–60 feet high, trunk 20 feet in girth. Wood hard, dark olive brown, much used; said to be indestructible under all conditions. Grows in the northern parts of the North Island only.

43. *Taranaki Committee*.

No. 16. *Vitex littoralis*.

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Order, Laurinæ. Genus, *Nesodaphne* (Hook).

No. 30.—*Nesodaphne tarairi* (Hook).

Tarairi (Col.) A lofty forest tree, 60–80 feet high, with stout branches. Wood white, splits freely, but not much valued. Grows in northern parts of North Island.

No. 21 in Alphabetical List.

No. 31.—*Nesodaphne tawa* (Hook).

Tawa (Col.) A lofty forest tree, 60–70 feet high, with slender branches. The Wood is light and soft and is much used for making butter kegs. Grows in the northern parts of the South Island, and also on the North Island, chiefly on low alluvial grounds; is commonly found forming large forests in river flats.

No. 22 in Alphabetical List.

43. *Taranaki Committee*.

No. 13. *Nesodaphne tawa*.

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Order, Moninacæ. Genus, *Atherosperma* (Lab.)

No. 32.—*Atherosperma novæ-Zelandiæ* (Hook).

Pukatea (Col.) Height 150 feet, with buttressed trunk 3–7 feet diameter; the buttresses 15 feet thick at the base.

Wood soft and yellowish; used for small boat planks.

Grows in the North Island, and northern parts of the Middle Island.

43. *Taranaki Committee*.

No. 2. *Atherosperma novæ-Zelandiæ*.

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Genus, *Hedycarya* (Forst).

No. 33.—*Hedycarya dentata* (Forst).

Kaiwhiria (Col.) A small evergreen tree 20–30 feet high. The wood is marked and suitable for veneering.

Grows in the North and South Island as far south as Akaroa.

43. *Taranaki Committee*.

No. 17. *Hedycarya dentata*.

Order, Proteacæ. Genus, *Knightia* (Br.)No. 34. *Knightia excelsa* (Br.)Woods.  
Exhibits and  
description—  
cont.

Rewarewa (Col.) A lofty slender tree 100 feet high. Wood handsome, mottled red and brown, used for furniture and shingles, and for fencing, as it splits easily. It is a most valuable veneering wood. Common in the forests of the Northern Island, growing upon the hills in both rich and poor soils.

No. 18 in Alphabetical List.

43. *Taranaki Committee.*

Nos. 9 and 32. *Knightia excelsa*.

Order, Magnoliacæ. Genus, *Drimys*.No. 35. *Drimys axillaris* (Forst.).

Horopito (Col.) Pepper tree of Colonists, and Winter's Bark. A small slender evergreen tree, very handsome. Whole plant aromatic and stimulant, used by the Maoris for various diseases. Wood very ornamental in cabinet work, making handsome veneers. Grows abundantly in forests throughout the islands. At altitudes of 1,000 feet the foliage becomes dense and reddish coloured.

No. 36.—*Drimys colorata* (Raoul).

This is a very distinct species, very common near Dunedin; it is a very ornamental shrub-tree with leaves blotched red.

42. *Westland Committee.*

No. 60, *Drimys colorata*.

Order, Violariæ. Genus, *Melicytus* (Forst.).No. 37.—*Melicytus ramiflorus* (Forst.).

Mahoe (Col.), or Hinehina (Geol. Sur.) A small tree 20–30 feet high, trunk often angular, and 7 feet in girth. The wood is soft, and not in use. Abundant throughout the islands, as far south as Otago, leaves greedily eaten by cattle.

42. *Westland Committee.*

No. 56 *Melicytus ramiflorus*.

Order, Malvacæ. Genus, *Hoheria* (A. Cum).No. 38.—*Hoheria populuca*, (A. Cum).

Houhere (Col.) Ribbon wood of Dunedin. An ornamental shrub-tree 10–30 feet high. Bark fibrous and used for cordage, and affords a demulcent drink. Wood splits freely for shingles but is not durable. Grows abundantly throughout the islands.

Order, Tiliacæ. Genus, *Aristotelia*.No. 39.—*Aristotelia racemosa* (Hook).

Mako. A small handsome tree 6–20 feet high, quick growing, with large racemes of reddish nodding flowers. Wood very light, and white in colour, and might be applied to the same purposes as the lime tree in Britain; it makes veneers.

42. *Westland Committee.*

No. 55. *Aristotelia racemosa* (Hook).

Genus, *Elæocarpus* (Linn.).

No. 40.—*Elæocarpus dentatus* (Vahl).

Hinan (Cum). A small tree, about 50 feet high, and 18 inches thick in stem, with brown bark which yields a permanent blue black dye used by the Maoris for colouring mats and baskets, and is used for tanning. Wood a yellowish brown colour and close grained, very durable for fencing and piles.

Common throughout the islands.

No. 1 in Alphabetical List.

42. *Westland Committee*.

No. 48 *Elæocarpus dentatus*.

43. *Taranaki Committee*.

Nos. 10 and 31 *Elæocarpus dentatus*.

Order, Olacineæ. Genus, *Pennantia* (Forst.).

No. 41.—*Pennantia corymbosa* (Forst.).

A small, very graceful tree, with white sweet smelling flowers, height 20–30 feet. Wood used by the natives for kindling fires by friction. Grows on the mountains of the Northern Island, and more abundantly throughout the Middle Island.

Order, Rhamnæ. Genus, *Discaria* (Hook.).

No. 42.—*Discaria toumaton* (Rouil).

Tumata Kuru (Col.) “Wild Irishman” of settlers. A bush or small tree with spreading branches; if properly trained would form a handsome hedge that would be stronger than white thorn. The spines were used by the natives for tatooing.

Order, Sapindacæ. Genus, *Dodonea* (Linn.).

No. 43.—*Dodonea viscosa* (Forst.).

Ake (Col.) A small tree 6–12 feet high. Wood very hard, variegated black and white, used for native clubs, abundant in dry woods and forests.

43. *Taranaki Committee*.

Nos. 1 and 25. *Dodonea viscosa*.

Genus, *Alectryon* (Gartner).

No. 44.—*Alectryon excelsum* (D.C.)

Titoki (Col.) A beautiful tree with large pinnacles of reddish flowers. Trunk 15–20 feet high, and 12 to 20 inches diameter. Wood has similar properties to ash and is used for similar purposes. Its toughness makes it valuable for wheels, coach building, &c., the oil of the seeds was used for anointing the person. Grows in the North and Middle Island, not uncommon in forests.

No. 24 in Alphabetical List.

43. *Taranaki Committee*.

Nos. 11 and 18, *Alectryon excelsum*.

Order, Coriariæ. Genus, *Coriaria* (Linn.).

Woods.  
Exhibits and  
description—  
cont.

No. 45.—*Coriaria ruxifolia* (Linn.).

Tuta-kihi (Col.) Tree tutu. A perennial shrub 10-18 feet high, trunk 6-8 inches diameter.

The so-called berries (fleshy petals) vary very much in succulence, the less juicy bearing seeds which according to Colenso are not poisonous. The juice is purple and affords a grateful beverage to the natives, and a wine like elderberry wine has been made from them. The seeds and leaves are said to produce convulsions, deliriums, and death, and are fatal to cattle and sheep. Abundant throughout the islands.

No. 42.—*Westland Committee*.

No. 59. *Coriaria ruxifolia*.

Order, Leguminosæ. Genus, *Sophora* (Linn.).

No. 46.—*Sophora tetraptera* (Aiton).

Honina (Hector). Kohwai. A small or middling sized tree. It has a splendid appearance, with large pendulous yellow flowers. Wood red, valuable for fencing, being highly durable; is also adapted for cabinet work. It is used for piles in bridges, wharves, &c. Abundant throughout the islands. No. 7 in Alphabetical List.

No. 43.—*Taranaki Committee*.

No. 12 and 24. *Sophora tetraptera*.

Order, Saxifrigææ. Genus, *Carpodetus* (Forst.).

No. 47.—*Carpodetus serratus* (Forst.).

Tawiri. White mapan or white birch (of Auckland). A small tree 10-30 feet high, trunk unusually slender, branches spreading in a fan shaped manner, which makes it of very ornamental appearance, flowers white, profusely produced. The wood is soft and tough, and might be used in the manufacture of handles for agricultural implements and axe handles. Grows in the northern and southern islands; frequent by the banks of rivers.

Genus, *Weinmannia* (Linn.).

No. 48.—*Weinmannia racemosa* (Forst.).

Towhai (Col.) Karmai (Hector). A large tree, trunk 2-4 feet diameter and 50 feet high. Wood close grained and heavy but rather brittle, might be used for plane making and other joiner's tools, block cutting for paper and calico printing, besides various kinds of turnery and wood engraving. The bark of this tree is largely used for tanning. An extract of bark by Mr. W. Skey gave on analysis a result that showed it was chemically allied to the gum kino of commerce, their value being about equal. Grows in the middle and southern parts of the northern islands, and throughout the southern islands.

42. *Westland Committee*.

No. 50. *Weinmannia racemosa*.

43. *Taranaki Committee*.

No. 8. *Weinmannia racemosa*.

Order, Rubiacæ. Genus, *Coprosma* (Forst.).

No. 49.—*Coprosma linariifolia* (Hook.).

An ornamental shrub tree, wood close grained and yellow; might be used for turnery. Grows in mountain localities of the North and South Island.

Woods.  
Exhibits and  
description—  
cont.

Order, *Jasminæ*. Genus, *Olia* (Linn.).

No. 50.—*Olia Cunninghamii* (Hook fil.).

Black maire. 40–50 feet high, 3–4 feet diameter, timber close grained, heavy, and very durable. Much of this timber is at present destroyed in clearing the land.

Order, *Santalaceæ*. Genus, *Santalum* (Linn.).

No. 51.—*Santalum Cunninghamii* (Hook fil.).

Maire. A small tree 10–15 feet high, 6–8 inches diameter, wood hard, close grained, heavy; used by the natives in the manufacture of war implements.

RESULTS OF EXPERIMENTS ON NEW ZEALAND TIMBER.

The dimensions of the specimens experimented on were one inch square and twelve inches long.

No.	No. in Description.	Native Names in Alphabetical Order.	Specific gravity.	Weight of a Cubic Foot.	Greatest weight carried with unimpaired elasticity.	Transverse Strength.
1	40	Hinan or Pokako ( <i>Elæocarpus dentatus</i> ).	·562	35·03	94·0	125·0
2	—	Kahika, supposed white pine	·502	31·28	57·8	77·5
3	7	Kahikatea, white pine, <i>Podocarpus dactyloides</i> .	·488	30·43	57·9	106·0
4	1	Kauri ( <i>Dammaria Australis</i> )	·623	38·96	97·0	165·5
5	2	Kawaka	·637	39·69	75·0	120·0
6	20	Kohokohe ( <i>Dysoxylum spectabile</i> )	·678	42·25	92·0	117·4
7	46	Kohwai ( <i>Sopliora tetraptera</i> var. <i>grandiflora</i> ).	·884	55·11	98·0	207·5
8	21	Maire. Black maire ( <i>Eugenia maire</i> ).	1·159	72·29	193·0	314·2
9	21	Maire ( <i>Eugenia maire</i> )	·790	49·24	106·0	179·7
10	39	Mako ( <i>Aristotelia racemosa</i> )	·593	33·62	62·0	122·0
11	—	Mangi or mangeo. ( <i>Tetranthera calicaris</i> ).	·621	38·70	109·0	137·8
12	16	Manuka ( <i>Leptospermum ericoides</i> )	·943	59·00	115·0	239·0
13	—	Mapau, red mapau, or red birch ( <i>Myrsine Urvillei</i> ).	·991	61·82	92·0	192·4
14	—	Mapau or tarrata, black mapau ( <i>Pettospermum tennifolium</i> ).	·965	60·14	125·0	243·0
15	4	Matai ( <i>Podocarpus spicata</i> )	·787	49·07	133·0	197·2
16	6	Miro ( <i>Podocarpus ferruginea</i> )	·658	40·79	103·0	190·0
17	17	Rata or iron wood ( <i>Metrosideros lucida</i> ).	1·045	65·13	93·0	196·0
18	34	Rewa-Rewa ( <i>Knightia excelsa</i> )	·785	48·92	93·0	161·0
19	8	Rimu, red pine ( <i>Dacrydium cupressinum</i> ).	·563	36·94	92·8	140·2
20	—	Ruino, supposed red pine	·604	37·63	94·0	163·0
21	30	Taraire ( <i>Nesodaphne taraire</i> )	·888	55·34	99·6	112·3
22	31	Tawa ( <i>Nesodaphne tawa</i> )	·761	47·45	142·4	205·5
23	47	Tawiri-Kohu-Kohu, white mapau or white birch ( <i>carpodetus serratus</i> ).	·822	51·24	80·0	177·6
24	44	Titoki ( <i>Alectryon excelsum</i> )	·916	57·10	116·0	248·0
25	5	Totara ( <i>Podocarpus totara</i> )	·559	35·17	77·0	133·6
26	12	Towai, red birch ( <i>Fagus mengiesii</i> )	·626	38·99	78·6	158·2
27	13	Towai, black birch ( <i>Fagus fusca</i> )	·780	48·62	108·8	202·5
28	21	Wawako ( <i>see also</i> Maire) ( <i>Eugenia maire</i> ).	·637	39·69	75·0	130·0
29	—	Whau ( <i>Eutetia arborescens</i> )	·187	11·76	13·0	32·0

The experiments were conducted in the following manner:—A pressure of 50 lbs. was applied for two minutes (as measured by a sand glass) and the sample was then released; 75 lbs. were then applied for the same time, and then 100 lbs., and so on increasing by 25 lbs. each time. Each time the sample was released the point on the deflection scale to which it returned was read, and when it came to be notably under the original reading it was allowed to remain unloaded for two minutes, to see whether it would in time recover itself. Then the pressure was gradually increased, without being removed, until it broke.

Method of  
conducting ex-  
periments.

## VII.—EDUCATIONAL AND ART.

### DEP. II.

#### Cl. 430.—Photographs.

Exhibits and  
description of  
photographs;  
life and scenery.

#### 36. *Burton Brothers, Dunedin.*

Views of scenery of South Island.

#### 36a. *Bothamley, A. T.*

Photographs of Maoris.

#### 37. *Government of New Zealand.*

Views of scenery, &c., by H. Deveril.

#### 38. *Taranaki Committee.*

1 and 2. Panoramic views of New Plymouth and surrounding scenery, looking North and South.

3. Mount Egmont, from New Plymouth.

4. Pukearuhe, White Cliffs, Taranaki.

5. Paritutu, the Great Sugar Loaf, Taranaki.

6. Sugar Loaf Islands.

7. Forest Scenery near the Waiwaikaiho River.

#### 38a. *Hector, J.*

Photographs exhibiting domestic life of the Maoris.

#### 39. *Photographs by D. L. Mundy.*

Mostly consisting of North Island Scenery.

Photographs of  
scenery, and  
sundries.

1. Patuka, or Store House, at Waihi, head of Lake Taupo.

2. A Digger's Home, Pongo Flat, Thames Gold Fields.

3. Wellington, from the Cemetery.

4. Government House, Wellington.

5. River Bed Scene on the Waipawa River, Poverty Bay.

6. Flax Mills at Hokianga Heads.

7. A Geological Study at Opoke, Hokianga, on the seashore (measures 40 ft. round).

8. Carved Panel from the Maori House, Colonial Museum, Wellington.

9. Victoria, Bay of Islands, where the Treaty of Waitangi was signed in 1842.

10. Momona Bay, Kawau, the Island Home of Sir George Grey, K.C.B.

11. Kororareka, or Russell, Bay of Islands.

12. Study of a Flax Bush (*Phormium tenax*) on the Waikiri River, Hokianga.

13. The Interior of a Native Pah at Kaitereira, Rotokakahi.

14. Teheki, head of the Waima River, Hokianga.

15. The Great Fern Trees of New Zealand, at Gnoke, Hokianga (40 ft. in height).

16. A Forest Scene, showing the Nikau Palms at Onoke, Hokianga.

17. A Study of the Great Mamuka or Ponga Tree Fern, on Ponga Flat, 1,200 ft. above the Thames Gold Fields, the River Thames in the distance.

18. Ohinemutu Rotorua, the commencement of the Hot Springs District, with Native Village or Kainga.

19. Rotokakahi, near Rotomahana.
20. Roto Tarawera, near Rotomahana.
21. Tokanui, head of Lake Taupo, showing the Geysers.
22. Roto Pounamu, Rotomahana, or Cold Green Lake, showing the steam holes in the Hot Taupes.
23. Fumaroles, or Boiling Mud Cones, Rotomahana.
24. General View of Rotomahana, looking east.
25. General View of Rotomahana, looking west.
26. The Te Tarata Geyser, Rotomahana.
27. The Otukapuarangi or Pink Terrace, Rotomahana.
28. Side View of the Te Tarata Terraces, Rotomahana.
29. Side View of the Pink Terrace, Rotomahana, showing the Great Stalactite Terraces.
30. The Te Tarata Terrace, Rotomahana, looking down on the Lake from the Crater.
31. The Crystal Slope of the Te Kiwi Geyser, Rotomahana.
32. Captain Cook's Bay, where he took the transit of Mercury, November 9th, 1769.
33. Cabbage Tree Palms, Governor's Bay, Canterbury.
34. Dyer's Pass Road, Head of Lyttleton Harbour.
35. Government Buildings, Christchurch, Canterbury.
36. Craigieburn Cutting, West Coast Road, Canterbury.
37. Study on the Oira River, Southern Alps, Canterbury.
38. The Bealey River Bed, Canterbury.
39. The Rolleston Range, with Glacier, Arthur's Pass, Canterbury.
40. Summit of Arthur's Pass, Westland, looking west.
41. Summit of Arthur's Pass, Westland, looking east.
42. Looking through the Forest on the Teremakau River.
43. On the Teremakau River Bed, Westland.
44. In the Kahikatea, or White Pine Forest, Westland.
45. An Hotel on the Gold Fields near Fox's Diggings, Westland.
46. White Pine Forest, West Coast Road, Canterbury.
47. Thames Gold Field, from top of Moanataiari Tramway, 1,200 ft. above the sea.
48. Akaroa Bay, Banks' Peninsula, Canterbury.

#### Maps and plans.

#### Cl. 300.—*Maps and Plans.*

##### *Collection made by Dr. Hector for the Commissioners.*

- 28A. 1. Official Maps of the Colony of New Zealand. Published by E. Ravenstein.
- 29A. 2. Geological Map of New Zealand, by Dr. Hector, MSS.
- 32B. 3. Geological Map. Small scale. Published by E. Ravenstein.
- 31A. 4. Model of New Zealand in Relief.
- 29B. 5. Plans and Diagrams of Gold Fields, &c.
- 28B. 6. Physical Map of New Zealand by Dr. Hector.
30. Geological Plans and Section by Dr. Von Haast.

#### Collection of aboriginal his- tory of labour.

#### Cl. 312.—*Garments, Ornaments, Weapons, &c., of the Maoris.*

##### *27A. Collection made for the Commissioners by R. W. Woon, R.M.*

1. *Haimona Te Ao o te Rangī*, chief of Ngatipanioaia tribe.—A patuparaoa, whalebone weapon, called "Pai a te Rangī," handed down from ancestor named Kahunui, four generations back. Has been used in many battles, in which several chiefs and heroes "were made to lick the dust."
2. *Horima Katene*.—A whalebone weapon called "Nga Kanae a Titokowaru," lately the property of the celebrated chief Titokowaru, who devastated the West Coast Settlements in the war of 1868. Is an heirloom of ancient date.
3. *Thakara Tukumarū*.—A Tewatewa-wooden weapon.
4. *Uranga Kaiwhare*.—A Kakati-carved whalebone weapon called "Kai-kanohi" (face eater) handed down for 12 generations.

5. *Takarangi Mete*.—A patuparaoa-whalebone weapon called "Tohiora." This is much prized, having been used by Te Maro, a member of the native Contingent in "knocking on the head, and despatching" the great prophet and leader of the Hauhau forces at the battle of Moutoa, in May 1864. Collection of  
aboriginal his-  
tory of labour-  
cont.

6. *Hohaia*.—A patuparaoa-whalebone weapon.

7. *Te Reimana*.—A patuparaoa-whalebone weapon.

8. *Te Reimana*.—A patu-stone weapon called "Kororariki."

9. *Te Koroneho*.—A patuparaoa-whalebone weapon.

10. *Reihana*.—A patu Kohatu, a stone weapon.

11. *Aperawiko Tamaite*.—A patu kohatu, a stone weapon.

12. *Captain Wirihana*.—A patuparaoa-whalebone weapon, small size.

13. *Keepa Rangitauira*.—A tewatewa, wooden battle-axe.

14. *Keepa Rangitauira*.—Taiaha Kwra, ornamented spear.

15. *Epiha Aokokiri*.—Taiaha, plain wooden spear.

16. *Mete Kingi*.—Taiaha, wooden spear, ornamented with feathers.

17. *Mete Kingi*.—Tewatewa, wooden battle-axe with feathers.

18. *Poutini*.—Tewatewa, wooden battle-axe.

19. *Rewi Raupo*.—Taiaha, wooden spear.

20. *Te Reniana*.—Taiaha, wooden spear.

21. *Paora Kahuatua of Ranana*.—Taiaha kura, ornamented wooden spear.

22. *Kiritakama*.—Taiaha, plain wooden spear.

23. *Taianhus*.—Taiaha, plain wooden spear.

24. *Tamihana te Aewa*.—Taiaha, wooden spear.

25. *Peina*.—Tewatewa, battle-axe.

26. *Paora Patapu*.—Taiaha, spear.

27. *Paora Patapu*.—A long spear, taken as spoils of war at a battle in the Taupo country in 1869, lately the property of Te Heuheu.

28. *Major Keepa*.—A Pouwhenua, ancient spear, much prized, called "Aketaurangai." This was used by the Wanganui chief Amarama in killing the great Ngapuhi chief Tuwhare in 1830 on the Wanganui River, when the Ngapuhi invaded that part of the island.

29. *Te Mawae*.—Tewatewa, a wooden battle-axe.

30. *Hoani Maramara*.—Korowai, flax (*Phormium*) mat.

31. *Hoani Maramara*.—Flax mourning cap and shark's tooth ear ornament.

32. *Uranga Kanihare*.—Motumotu, ornamented flax mat. Much prized by Maoris.

33. *Rini Remoata*, chief and assessor.—Kakahu Kura, flax mat ornamented with the red feathers of the Kaka or mountain parrot. Much prized.

34. *Menehira*.—Parawai, flax mat with rich border.

35. *Reneti Tapa*.—Flax mat, interwoven with feathers of the native wood pigeon, called Waitahuparai; intended as a gift to the President of the United States.

36. *Hori Te Roka*.—Ugare, flax mat.

37. *Major Keepa*.—Dyed flax cap.

38. *Captain Wirihana Puna*.—Kakahu Kura, ornamented flax and feather mat; intended as a gift to the President of the United States.

39. *Captain Mei Hunia*.—Parawai, ornamented mat.

40. *Pehira Turei*, Queen's pensioner.—Toi mat made from Toi plant found at foot of Tongariro, or the burning mountain.

41. *Pehira Turei*.—Dyed flax mourning cap.

42. Maori Adze, called an Aronui. Two ancient fish-hooks, tipped with human bone. Wooden flute, called a Koauan, used for warbling love ditties.

43. *Aperahama Tahuniarangi*.—Carved image from front of ancient Maori house, called "Tamahaki," descended from ancestors 10 generations back.

44. Carved pipe, made of reta, called "Takirau," and specimen of dyed flax.

45. *Hakaria*.—Hei Tiki, ancient greenstone neck ornament.

46. *Pehinana*.—Carved calabash top, called "Toka Taha."

47. *Hami*.—Two carved wooden implements, used in planting Kumaras (sweet potato), called "Ko Kumara."

48. *Te Hira*.—Specimens of flax, plain and dyed black.

49. *Karaitiana*.—Hatchet, with carved handle. Patiti.

50. *Poari Wharehuia*.—Hei Tiki greenstone neck ornament.

Collection of  
aboriginal his-  
tory of labour—  
cont.

51. *Hiri Te Roha*.—Ancient paddle for steering a canoe.  
52. *Shark's Tooth* ear ornament and a fish-hook. (made of Pawa shell) used as a bait to catch the fish called Kahawi.  
53. *Te Hira*.—Skin of the Huia (*Heteralocha gouldi*). A chief's head ornament.  
*Te Hira*.—A Pounamu (greenstone) ear pendant of great lustre.  
54. *Pikikotuku*.—Pounamu ear ornament.  
55. *Hine Maaka*.—Native comb, called a karau.  
56. *Hine Maaka*.—Greenstone ear pendant.  
57. *John Mark*.—Two whale's teeth garment fasteners and a greenstone ear ornament.  
58. *Major Keepa*.—Greenstone adze, called an Aronui, very ancient.  
59. *Major Keepa*.—Skin of the Huia (*Heteralocha gouldi*), head ornament of a chief.  
60. *Rev. B. K. Taylor, Wanganui*.—Hat made of Kiekie (*Fryceniticia banksii*), manufactured by Hori Mutumutu flax for the waist.  
61. *R. W. Woon, R.M., Wanganui*.—Ancient stone axe of 10 generations back.  
62. *Hori Kingi Mawae*.—Paddle with carved top.  
63. *Te Mawae*.—Stone hatchet of 10 generations back.  
Cl. 340. 34. 64. *Reupea Tauria*.—Paddle.  
65. Maori Image with head dress and ear ornament of Toroa feathers called "Rakeik furoa."  
66. *Heretara*.—Whakakai, greenstone ear ornament.  
67. *Turahui*.—Pigeon feather mat, Eheruheru, with greenstone ear pendant attached.  
68. *Taranaki Committee*.—Hei Tiki, greenstone image worn round the neck; 2 ancient axe head of stone.  
69. *Taranaki Committee*.—Taiaka, ornamented with Kaka (parrot) feathers.

Sundry manu-  
factures, exhibits  
and description.

#### MANUFACTURES.

##### ANIMAL AND VEGETABLE PRODUCTS.

- |                  |    |   |
|------------------|----|---|
| Preserved meats. | 63 | Cl. 656. 1. <i>New Zealand Provision and Produce Company, Christchurch, Canterbury</i> .—4 tins ox tongues; 5 tins sheep tongues; 4 tins corned beef; 3 tins boiled beef; 4 tins corned mutton; 4 tins boiled mutton. All hermetically sealed and preserved so as to keep good for years.   |
| Tomato sauce.    | 64 | Cl. 656. 2. <i>David Nairn, Addington, Canterbury</i> .—Tomato Sauce. Value 16s. per doz. pints, 8s. per doz. half-pints.   |
| Soap.            |    | 3. <i>John Horler, Woolston, Canterbury</i> .—56 lbs. Soap; value 28l. per ton.   |
| Candles.         |    | Cl. 659. 4. <i>John Horler, Woolston Canterbury</i> .—40 lbs. Mould Candles; value 4½d. per lb.   |
| Chicory.         | 65 | Cl. 656. 5. <i>Trent Brothers, Christchurch, Canterbury</i> .—Chicory in two stages of preparation. Can be put free on board at Port Littleton at from 5d. to 6d. per lb., according to package. Photographs of the works and descriptive pamphlet.   |
| Fruit wines.     | 66 | Cl. 660. 6. <i>James Smith, Nelson</i> .—12 sorts of Fruit Wines.   |
| Ale and porter.  | 67 | Cl. 660. 7. <i>Henderson and Farrar, Wanganui, Wellington</i> .—6 bottles Ale (No. 1). Prepared from malt and hops both grown and made in Nelson. Value 8s. per dozen. Brewed 18th June 1875; bottled 18th July 1875.<br>Cl. 660. 6 bottles Ale (No. 2). Prepared from malt grown and made in Canterbury, and from hops grown in Nelson. Brewed 21st August and bottled 14th September 1875. Value 8s. per dozen.<br>Cl. 660. 6 bottles Porter (No. 1). Prepared from malt and hops both grown and made in Nelson. Brewed 21st June and bottled 22nd July 1875. Value 10s. per dozen. |

Cl. 660. 6 bottles Porter (No. 2). Prepared from malt grown and made in Canterbury, and from hops grown in Nelson. Brewed 24th August and bottled 21st September 1875. Value 10s. per dozen.

Cl. 660. 1 keg of Bulk Ale, prepared from malt grown and made in Canterbury, and from hops grown in Nelson. Brewed 15th October 1875. Value 5l. per hogshead.

- 58 Cl. 652. 8. *Thomas Wilson, Woolston, Canterbury.*—Saddle and Harness Leather. 1 side black Harness; 1 side brown Harness; 1 side black Rein; 1 side fair Skirt; 1 side fair Saddle Seat; 1 side Thong Hide; 1 side stained Stirrup; 1 side stained Bridle; 1 side stained Bag; 1 stained Hogskin; 1 fair Hogskin. Saddle and harness leather.
- Cl. 652. Shoemakers' Leather: 1 side waxed Kip; 1 side grained Kip; 1 waxed Calf Skin; 1 grained Calf Skin; 2 Kid Skins; 1 black grained Goat Skin; 2 black Basils; 1 sole Butt. Shoemakers' leather.
- Fancy Coloured Skins for Shoemakers and Bookbinders: 1 strained Basil; 1 soft Basil; 3 dyed Sheepskins; 5 dyed Goat Skins; 7 coloured Mats of various colours.
- 59 Cl. 652. 9. *Armitage, Taranaki.*—Dressed Kip and Calf Leather prepared with bark of *Acacia decurrens*. Dressed kip and calf leather.
- 60 Cl. 296. 10. *Thomas Morris, Oamara, Otago.*—Improved Gentleman's Town Saddle. The improvement consists of the skirt being joined together and fitted all round the cantle. Value in New Zealand, with furniture complete, 10l. 10s. Town saddle.

#### WOVEN AND FELTED GOODS.

- 9 Cl. 235. 11. *Webley Brothers, Nelson.*—3 samples of Nelson Tweeds. Tweed, made from New Zealand wool. Price 5s. 6d. per yard.
- 9 Cl. 235. 12. *Webley Brothers, Nelson.*—1 case of samples of Nelson Tweed, made from New Zealand wool.
- 10 Cl. 237. 13. *James Cook, Nelson.*—Woollen Rugs woven and dyed at Nelson. Rugs.
- 10 Cl. 237. 14. *James Cook, Nelson.*—Woollen Mats woven and dyed at Nelson. Mats.
- Cl. 200. Cl. 272. 15. *W. M. Innes, Port Chalmers, Otago.*—3 half-pint bottles of Cod Liver Oil. Cod liver oil.

#### MISCELLANEOUS GOODS.

Cl. 300. 1. *P. W. Tatton, Nelson.*—Map of the province of Nelson, showing localities of mineral deposits.

- Cl. 709. 2. *J. Henry and Company, Taranaki.*—Dried Ferns. Collection of dried ferns.
- Plate 1. *Davallia novæ-zealandiæ*; *Lindsæa trichomanoides*; *Asplenium falcatum*; *Polypodium regulosum*. Names of species.
- Plate 2. *Alsophylla colensoi*; *Asplenium* sp.; *Pteris macilenta*.
- Plate 3. *Adiantum cunninghamii*; *Pteris incisa*; *Nephrodium hispidum*; *Trichomanes reniforme*.
- Plate 4. *Marattia salicina*.
- Plate 5. *Dicksonia lanata*; *Doodia caudata*; *Asplenium hookerianum*; *Hymenophyllum densum*; *Hymenophyllum*; *Lomaria fluiratililis*.
- Plate 6. *Aspidium coriaceum*.
- Plate 7. *Davallia novæ-zealandiæ*; *Lindsæa trichomanoides*; *Lomaria nigra*.
- Plate 8. *Hymenophyllum dilatatum*; *Hymenophyllum æruginosum*; *Lomaria fluiratililis*.
- Plate 9. *Cyathea medullaris*; *Asplenium obtusatum*; *Pteris macilenta*.
- Plate 10. *Pteris incisa*; *Aspidium cystostegia*; *Lomaria bulbiferum*; *Hypolepis distans*.

- Plate 11. *Asplenium umbrosum*.  
 Plate 12. *Lomaria lanceolata*; *Cyathea dealbata*.  
 Plate 13. *Nephrodium hispidum*; *Lomaria elongata*; *Polypodium lillardieri*.  
 Plate 14. *Hymenophyllum æruginosum*; *Hymenophyllum pulcherrimum*; *Polopodium grammitidis*.  
 Plate 15. *Leptopteris superba*; *Dawsonia superba*.  
 Plate 16. *Polypodium pennigerum*.  
 Plate 17. *Polypodium billardieri*.  
 Plate 18. *Cyathea medullaris*; *Cyathea dealbata*; *Asplenium umbrosum*; *Lomaria nigra*; *Trichomanes reniforme*.  
 Plate 19. *Pteris macilenta*; *Cyathea smithii*.  
 Plate 20. *Nephrodium hispidum*.  
 Plate 21. *Gleichenia cunninghamii*; *Millefolium distans*.  
 Plate 22. *Lomaria bulbiferum*; *Aspidium richardii*; *Nephrodium hispidum*; *Pteris scaberula*.  
 Plate 23. *Asplenium falcatum*.  
 Plate 24. *Lomaria bulbiferum*.  
 Plate 25. *Asplenium obtusum*; *Pteris-scaberula*; *Pteris esculenta*; *Lomaria fluviatilis*.  
 Plate 26. *Leptopteris hymenophylloides*.  
 Plate 27. *Pteris tremula*; *Cyathea dealbata*; *Aspidium cystostegia*; *Hymenophyllum densum*; *Hymenophyllum pulcherrimum*; *Lomaria nigra*.  
 Plate 28. *Lomaria elongata*; *Aspidium richardi*.  
 Plate 29. *Lomaria vulcanicum*; *Hymenophyllum æruginosum*; *Lomaria bulbiferum*; *Cyathea dealbata*; *Asplenium umbrosum*.  
 Plate 30. *Polypodium*, several species.  
 Plate 31. *Trichomanes elongata*; *Hymenophyllum æruginosum*; *Hymenophyllum pulcherrimum*.

Fungus.

3. *Taranaki Committee*.—Fungus (*Hirneola polytricha*) used as food by the Chinese. Largely exported from the colony. Grows principally on the Tawa.

Esculent fern root.

4. *Taranaki Committee*.—Esculent Fern Root. Will germinate if crushed and planted in rich soil in a shady place.

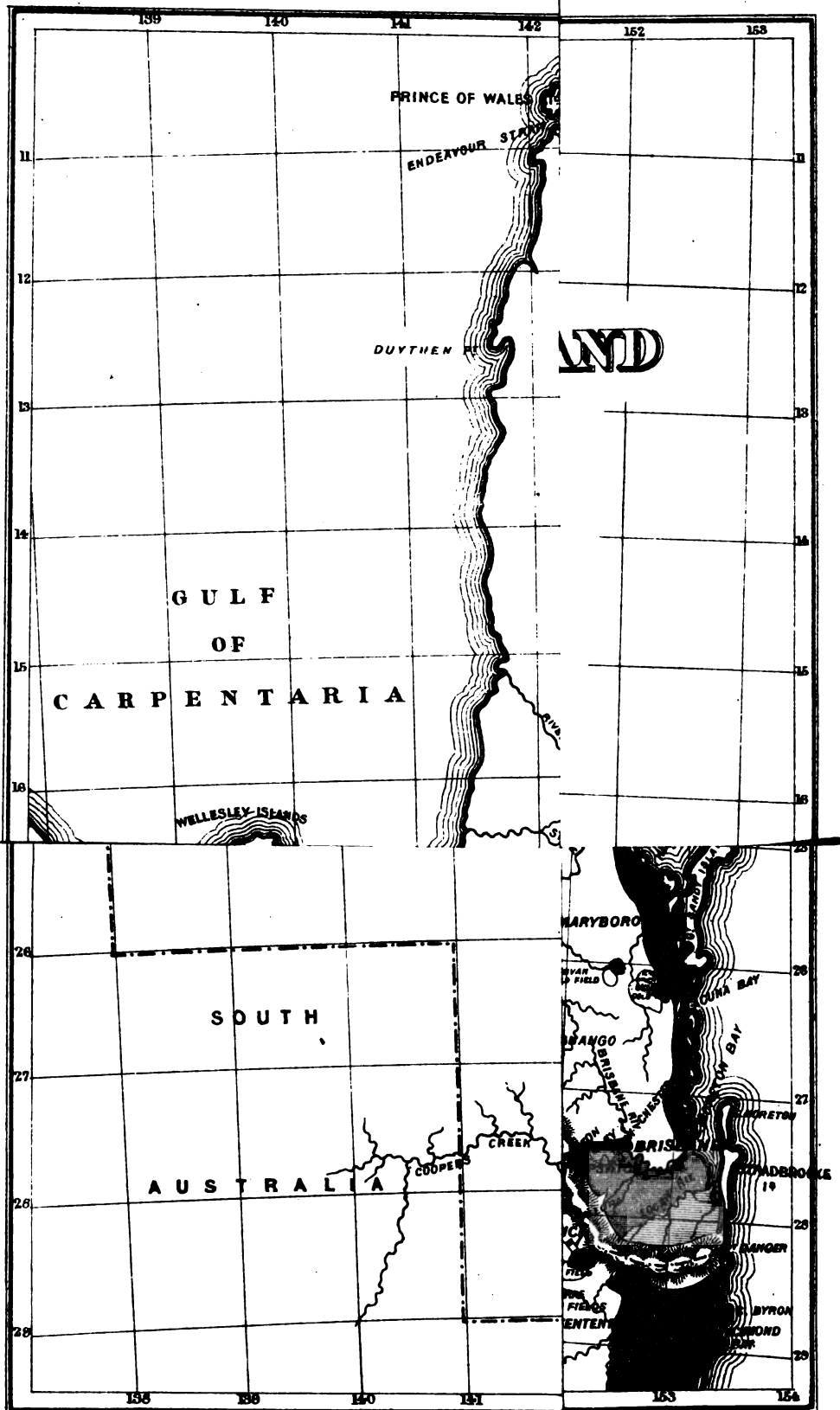
Bird's nest fungus.

5. *Taranaki Committee*.—Bird's Nest Fungus and curious Parasite.

#### FURNITURE, &c.

- 7 6. *Greenfield and Stewart, Wellington*.—Door made of Rimu (*Dacrydium cupressinum*) Red Pine of settlers.





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**QUEENSLAND.**

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COMMISSION FROM QUEENSLAND  
TO THE  
INTERNATIONAL EXHIBITION, PHILADELPHIA, 1876.

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ANGUS MACKAY, Esq.  
ROBERT TOOTH, Esq.  
WALTER HILL, Esq., Curator, Botanical Gardens.  
RICHARD DAINTREE, Esq., late Agent-General in England.  
P. R. GORDON, Esq., Chief Inspector of Stock.  
CARL STAIGER, Government Chemist.  
S. WEBSTER, Esq., Secretary.

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*Resident Representative Commissioners.*

ANGUS MACKAY, Esq.  
HON. ARTHUR MACALISTER, Agent-General in England.  
ROBERT TOOTH, Esq.

## QUEENSLAND.

### GENERAL REPORT upon the PHILADELPHIA EXHIBITION.

The space occupied by the colony of Queensland was 35 by 120 feet. Lengthways this space was bordered by walls 15 feet high. The space completed the square occupied by the Australasian Colonies in the Main Centennial Building.

Space and position occupied by colony at Exhibition.

The Queensland Court, formed as described, was filled with exhibits essentially Australian in character; and they very fairly represented the general appearance and climate of the colony, its productions, and the everyday life of the colonists. At an early date of the exhibition the Queensland Court won a high reputation for systematic arrangement. This reputation was held to the end, and the judges took occasion to put upon record their admiration of this feature.

Details of exhibits.

The colony represented in this department is one of the Australian group. It occupies the north-eastern section of the island. The total area of the colony is 433,920,000 acres. The land is well broken up by rivers, the coast line being particularly fortunate in this respect. In its natural state the great bulk of the whole area of Queensland is rich in indigenous grasses. Grazing is the principal industry; but mining, sugar-growing, and agriculture generally are progressing steadily. The country is rich in coal, gold, tin, copper, iron, antimony, and many other metals—each of which was well represented at the Centennial, and received much attention from mercantile men.

Position, area, and general description of colony.

Resources—mineral.

The wool of the country (Australian merino), although not largely, was well represented. This exhibit was forwarded by the Inspector of Sheep in the colony, P. R. Gordon, and was most effective as illustrative of Queensland wool. Fleeces in the grease, just as cut from the sheep's back, were shown. The judging in this department was carefully done, several weeks being occupied. The Queensland wools, in the awards of the judges, are found to occupy a first rank.

Wool.

There were fifteen exhibits of sugar shown, fairly representing the sugar industry of the country; the Mackay, Maryborough, Brisbane, Logan, and southern districts being represented.

Sugar.

The mineral products of Queensland were represented by seven blocks of coal from mines in the West Moreton (Ipswich) district; by some four tons of refined tin in ingots; by an equal quantity of copper from Peak Downs, Mount Perry, and Normanby; by gold-bearing quartz from each of the gold mining districts. An obelisk, 22 feet in height, showed how much the gold got since its discovery in Queensland in 1868 would make in bulk—in all, 65 tons by weight, and worth 35,000,000 dollars. The various minerals were also shown in the crude state, the tin districts being specially well represented.

Mineral exhibits.

The usual avocations of colonists—in mining, agriculture, travelling, timber-getting, and other avocations—were illustrated in a series of over 200 colored photographic pictures, sent by Richard Daintree, late Agent-General for Queensland in England. The collection was very handsome and effective.

Avocations of colonists.

Queensland exhibited a fine collection of botanical specimens, sent by F. M. Bailey. This collection—the most complete sent, up to that time, from Australia to America—has been taken over by the U.S. Agricultural Department, in order to illustrate the flora of Northern Australia in their Museum at Washington.

Flora—exhibit.

Of fibres, also, the court had a fine collection, prepared by Alexander McPherson. These fibres have been distributed to various public institutions in America; the greater portion, however, remaining in the Agricultural Department.

Fibres.

Printed matter—the public journals from all parts of the colony, neatly bound: the statutes and other public documents; and maps, charts, and

Printed matter.

plans of the colony—was shown and distributed in great plenty, and selections of each sent to the public institutions of the United States and Canada.

**Timber.** The timber shown, although abundant in number—there being over 300 varieties shown—did not fairly represent this portion of colonial wealth. Queensland is rich in timbers, but the specimens shown were poor. The best of them were presented to the National Museum of the United States at Washington.

**Grain.** Very fine grain; wheat, oats, barley, maize, &c., were shown, illustrating the grain-producing capabilities of the country. Preserved fruits, of semi-tropical kinds, were shown by W. H. Hayes.

**Preserved fruits.** Prepared skins of Australian animals, and leather of the various kinds known to commerce, were shown by T. B. Stephens. The skins were a great attraction, and the quality of the leather well spoken of.

**Skins and leather.** The Commissioners in Queensland, who got the exhibits together and sent them to Philadelphia, were: P. R. Gordon, Chief Inspector of Stock; Walter Hill, Curator, Botanical Gardens; Angus Mackay; Carl Staiger, Government Chemist; S. Webster, Secretary. Richard Daintree was gazetted as a Commissioner for Philadelphia, and sent off from England the collection of articles collected there. At Philadelphia the Commissioners were Angus Mackay, Hon. Arthur Macalister, Robert Tooth.

**Commissioners.** The Prize winners from Queensland are:—

<b>Awards.</b>	<b>Wool, Australian</b>		- G. H. Davenport, Headington Mills, Darling Downs (acknowledged to be the most perfect exhibit at the Centennial); C. H. Green, Goomburra, Darling Downs; George Clarke, East Talgai; Shanahan and Jennings, Westbrook; Marshall and Slade, Glengallan; B. Fisher, Darling Downs; F. E. Lester, Rosenthal (N.B. Australian Company); B. E. Parr, Chiverton, Warwick; Donald Gunn, Pikedale; Gore and Co., Yandilla; Fenwick and Scott, Brisbane, for assortment of Wools.
	<b>Merino, all.</b>		Charles Clarke, Talgai, for Angora goat hair.
	<b>Tin</b>	-	- Brisbane Tin Refining Company for tin in bars. W. C. Hume, Brisbane, for collection of tin ores. Bentinck Tin Mining Co., tin ore. Bulimba Smelting Works, Stanthorpe, refined tin.
	<b>Copper</b>	-	- Peak Downs Company, for refined copper, for malachite, and for ores. Mount Perry Company for refined copper. Bentrup Copper Company for refined copper.
	<b>Antimony</b>	-	- A. C. Gregory, St. John's Creek, Burnett District, for refined star regulus of antimony.
	<b>Sugar</b>	-	- Fryar and Strachan, Loganholm; A. H. Brown, Maryborough; J. E. Davison, Mackay.
	<b>Wheat</b>	-	- George Downs, Darling Downs. All the wheat had suffered from weevil; otherwise there would have been more prizes.
	<b>Flour</b>	-	- F. Keates, Allora; Mader Brothers, Toowoomba.
	<b>Silk</b>	-	- C. F. Chubb, Ipswich; John M'Donald.
	<b>Arrowroot</b>	-	- Grimes Brothers, Mackay; Henry Lane, North Pine; W. Marks, North Pine.
	<b>Botanical Collection</b>	-	- F. M. Bailey, Brisbane.
	<b>Geological Collection</b>	-	- Richard Daintree.
	<b>Photographs, Coloured</b>	-	- Richard Daintree.
	<b>Printing and Binding</b>	-	- Government Establishment, Brisbane.
	<b>Collection of Timbers</b>	-	- P. A. O'Shannesy, Rockhampton. Walter Hill, Brisbane, wood specimens. C. M. Carey, Brisbane, box of Australian woods. Alexander McPherson, Brisbane, fibres.

Opals - -	- J. Bishop, Barcoo.
Leather and Skins	- T. B. Stephens.
Barks - -	- J. C. Baird, Cardwell.
Spices - -	- J. H. Boreham.
Case of Butterflies	- G. Richland, Cardwell District.
Dugong Oil and Specimens.	- John Ching, Hervey's Bay, Maryborough.

In a supplementary list the following Queensland exhibitors were awarded **Supplementary prizes :—** **List.**

Government of Queensland—

For Collective Exhibit.

For gold.

For raw cotton.

The Commissioners of Queensland, for model of obelisk of gold. This had all through been a feature of the court, and Professor Baird decided that it should find a place in Washington.

For systematic arrangement of exhibits.

For coal exhibits.

For vegetable fibres.

J. E. Davidson, Port Mackay, for rum. The other exhibits of this kind were injured on the passage over.

The Sheriff of Queensland for saddlery.

John M'Donald, St. Helena, for sugar.

Government Lithographic Department, for maps. Very highly reported on.

Irwin Brothers, for wine.

J. H. Hocker, Brisbane, tobacco leaf.

Angus Mackay, for cotton. Works on tropical agriculture.

T. B. Stephens, for furred skins.

W. H. Hayes, candied Australian fruits.

Normanby Copper Mine, copper ores.

The present Governor of Queensland is W. W. Cairns, Esq. The Executive of the country are :—Colonial Secretary, Hon. R. M. Stewart; Treasurer, Hon. J. R. Dickson; Postmaster-General, Hon. C. S. Mein; Attorney-General, Hon. S. W. Griffith; Minister for Lands, Hon. J. Douglas; Premier and Minister for Works and Mines, Hon. G. Thorn. **Governor and Cabinet.**

The form of government is similar to that of the "mother country." There is an Upper and a Lower House. Education is free, and well provided for in schools all over the country. Railroads, roads, and bridges are under the control of the Executive. Postal and telegraphic communication are available all over the country, and are under the care of the Executive. The population of the colony, according to preliminary census taken May 1, 1876, was 173,180; of whom 105,016 were males. There is absolute freedom in religious affairs in Queensland; each denomination managing its own spiritual affairs as seems best and fitting. The State exercises no control in such matters. **Form of government. Education. Railways. Postal and telegraphic communication. Population. Religious freedom.**

In order to afford information regarding the country, an Emigration Department is maintained in London at 32, Charing Cross. From this office free and assisted passages to the colony are issued. Passengers are despatched in ships chartered by the Emigration Department of the Queensland Government, and special care is taken of them during the voyage. **London offices.**

Philadelphia, U.S.A.,  
November 19, 1876.

ANGUS MACKAY.

**Queensland.**

Queensland, the north-east section of Australia, is a colony of vast size, and indeed, if we bear in mind that the most of it is available land either for pasture, agriculture, or mining, it may be called the largest in the Australian group. Its area is nearly three times that of the vast territory of Texas, in North America, and its seaboard equals in length, and greatly resembles in shape, that of the United States, from Maine to Louisiana, the Florida peninsula corresponding to that of Cape York, and the Gulf of Mexico to that of Carpentaria. To give a sketch of the features of so grand an area, one must be content with a mere outline in a work like the present. The most southerly point in Queensland consists of the highlands of Stanthorpe, the seat of the rich tin mines; a granite table-land, with an average elevation of some 2,800 feet, and a climate resembling that of the south of England. The splendid black and amber crystals of tin oxyd are lavishly scattered in this district. Immediately adjoining, and on the north, lie the far-famed Darling

Physical features  
and natural pro-  
ductions.

Darling Downs.

Downs, at a general altitude of 1,600 feet above sea level, with the climate of Southern France, and one of the finest pastoral districts in the world. Open lagoons (so to speak) of rich treeless herbage are bounded, as it were, by shores of sheltering, open-timbered land, with jutting capes of forest here and there running out and dividing the grassy spaces into imaginary bays and lakes of verdure; and the natural herbage, being grown on decomposed volcanic soil, is so rich that, in nutritive power, it equals the best corn and hay combined. These Darling Downs lie on the western escarpment of the great Australian Cordillera, which runs parallel to its east coast for 1,800 miles, and at about 70 miles back from the sea, and which separate the Darling Downs from the Moreton and Logan districts, a country rich in the finest cannel coal, and with good soil, well watered. The Wide Bay and Burnett district follow next, as we go northward, and in addition to their rich pastoral and agricultural capabilities, here lie the lucrative gold and copper fields of Gympie, Kilkivan, and Mount Perry, of which more hereafter. Gympie is famous for its rare mineral developments, such as walls of glittering calcespar, with rich imbedded gold all through them, and this gold and copper in any other part of the world, nearer to civilisation and capital, would be centres of attraction and busy population to one hundred times the extent of their present census. The rivers of Queensland, in the part we have at present described, consist chiefly of the Brisbane and the Mary, both as wide as the Thames, and fairly navigable for sea-going vessels for miles up from the mouth. Immediately to the north of the district last described, comes that of which Rockhampton is the shipping port. Here we cross the tropic, and nature begins to show on a vaster scale—larger rivers, larger plains, and larger animals are found. The two rivers, Fitzroy and Burdekin, drain a country larger than the ancient kingdom of France, and the great Australian alligator, 25 feet long, is found in them. Here, again, we have gold and copper in abundance; gold, silver, lead, and copper all being visible at once in one piece of quartz in many of the lodes hereabout. The zamais and other tropical palms begin to appear, as well as those gorgeous "scrubs" which obtain throughout the whole colony, and in whose moist, cool, green aisles the sun can seldom intrude, and the bush fire never, and where the giant fig-tree (*macrophylla*) towers like a cathedral cupola above all its fellows.

Wide Bay and  
Burnett district.

Gympie.

Rivers.

Minerals.

Vegetation.

Northward and  
westward.

Mineral wealth.

Pastoral wealth.

Copper mines.

Still passing northward from the country which makes Rockhampton its centre, the constant westerly trend of the Queensland coast becomes more noticeable, and soon the rich sugar plantations on the Pioneer river are reached, spread over almost treeless plains with rich soil of measureless depth; and then come more rich mines of gold, plenteous coal and copper, with countless interspersed lead and silver lodes, carrying associated gold, but all quite neglected and unnoticed amid so much other wealth. Tracts of country near the Burdekin river as large as some English counties are covered with networks of mineral reefs, made up of richly golden mundic, whose untold wealth could only yield fully to the scientific efforts of an army of chemically-skilled miners, and which is all lost to the present rough operators. We have not said much hitherto of the pastoral wealth of the colony, but the whole of it is, none the less, abounding in sheep, cattle, and horses, whose interests all the minerals and sugar tend to keep going instead of interfering with. The Cloncurry copper mines are abundantly rich in the beautiful clear red crystals

of the famous ruby oxide—the most valuable and easiest-smelted copper ore known. They lie on the Cloncurry river, which runs into the Gulf of Carpentaria, as does also the Gilbert, which, besides the universal gold, affords some of the most superb oriental agates and sardonyxes in the world, fully rivalling, if not surpassing, the best deposits of Uruguay and Brazil in the size, transparency, and brilliant colouring of the stones. It would simply be monotonous to follow the description of the colony northward and to describe the golden wealth, in reef and alluvial, which stretches away into the Cape York Peninsula, so we will be content, and work our way back and south to the opal mines of Western Queensland, after a farewell glance at the coralline beauties of the Great Barrier Reef on our north-eastern sea frontier, which ably bears the palm as premier coral bank of the world; 1,200 miles in length. Western Queensland introduces us to the great water-shed of the Warrego, Thomson, and Barcoo rivers, which mostly find their final outlet in the Murray river system of South Australia. This part of Queensland is so open and level that many a water-shed is imperceptible in dry weather, and it is often not until the heavy monsoon rains of the wet season send the water along in a wide and almost inevitable wall on to the unwary traveller that he perceives, for the first time, that there is a depression and a watershed under his feet at all. In Western Queensland lie the trachytic conglomerates which form the matrix of that gleaming and gorgeous gem, the priceless opal, in its varied hue and shades of purple, green, ruby, amber, blue, orange, and other fluorescent fires. This stone, with the large, clear, glowing red chrysolites of the Burnett river, and the delicate aqua-marine of Stanthorpe, are the leading gems of Queensland. The sapphires are small, so are the diamonds; the true ruby is no larger than a grain of sand, and the emerald is absent altogether. All this vast western country is rapidly being filled up with the sheep and cattle it so well can carry, its distance from the eastern sea coast being atoned for by river navigation on the Darling to South Australia.

Agates and sardonyxes.

Coral banks.

Western Queensland.

Opals.

Chrysolites.

Aqua-marines.

Sapphires, diamonds, and rubies.

Seaboard.

Prairies.

Coast.

This notice of the topography of Queensland would be all incomplete if no mention were made of the lengthy seaboard which mark its giant frontiers on the east, and the equally vast rolling prairies of the west, in which either Germany or Austria might be comfortably placed, and with plenty of room all round the edges to spare. The coast of Queensland is dotted with some of the most beautiful islets in the world, grassy and fertile to the water's edge; some being low, open, park-like, and clean beached, and some being high, woody, and grand of aspect. They lie chiefly between the 18th and 22nd parallels of latitude, inside the Great Barrier Reef, in the smooth shallow sea which is enclosed between it and the mainland. The east coast of Queensland, therefore, is distinguished by many picturesque beauties of reef, island, mountain, and river, and the sunset of the tropics sheds its glory on many a tranquil scene by the shore where a new Robinson Crusoe might meet with romantic adventures to eclipse even the old time-hallowed escapes in Defoe's original and charming tale. And for the vast western plains of the Warrego and Thomson, the Barcoo and the Bulloo, who shall measure the limit of their pastoral and productive wealth in the future?

The foregoing description is copied from the "Queenslander" newspaper in its special edition for the Philadelphia Exhibition.

The general arrangement of the Queensland Court at Philadelphia was carried out with the view of showing at a glance the physical character and natural products of the colony. The physical character was shown by a series of photographs illustrating the various geological formations of the country, and beneath the photographs the natural products of such formations were presented to view in specimen cases.

Arrangement of exhibits.

One side of the Queensland Court was devoted entirely to a delineation of the colony from a geological point of view; the other illustrated its mining, pastoral, agricultural, and other industries, and over each division was a tablet of information.\*

\* Most of these photographs were taken by Mr. R. Daintree, whilst travelling in Queensland, by a "dry process," in which the gum resin of one of the Australian Eucalypti was used as the "preservative" mixture; they were afterwards enlarged by the autotype process, and coloured in oil.

## DIVISION I.—ALLUVIAL.

Geological features.  
Division I.—  
Alluvial.

From the illustrative tablet in this division we learn that:—

*Soil.*—Rich vegetable mould on scrub land. Various composition, otherwise, according to rock débris forming it. Generally adapted to agricultural purposes.

*Products.*—Cotton, sugar-cane, maize, &c. in perfection; cereals where climate suitable. Alluvial gold in auriferous districts.

These facts, as given in the descriptive tablet, indicate that in the alluvial districts valuable agricultural products can be freely grown, and that gold exists in other parts.

Illustrative  
photographs.

Photograph No. 1 is a view near Brisbane, showing a small villa residence on the alluvial banks of Breakfast Creek. Every kind of garden produce can be easily raised on any of the tributary creeks of the Brisbane river.

No. 2.—A view of a portion of the Mary river, considerably north of the township of Maryborough. The left bank shows the thickness of the alluvium which, so far as cultivation is concerned, is apparently inexhaustible.

No. 3.—Also a view of a Queensland river, showing a dense growth of scrub on the one side, and open forest country on the other.

No. 4.—A view of Maryvale Creek, lat. 19°30' north. On the banks of this creek the older alluvia of the country are rather extensively developed, and in them the remains of extinct marsupials abound, such as enormous kangaroos, the extinct *Diprotodon*, &c.

No. 5.—This is a characteristic view of mining for gold in the deep alluvial drifts. Here the miners are seen working in the alluvium, the depth of which varies from 50 to 120 feet. Handsome returns of gold are yielded at the latter depth. Such deep sinking, however, is rather rare in Queensland, as nearly all the alluvial gold is found in shallow drifts, rarely exceeding 20 feet in depth.

No. 6.—This may be taken as a fairly representative view of the coast country in Queensland. The alluvial deposits are generally very extensive, and the country ordinarily flat from the absolute coast line to the first inland range.

No. 7.—Another view of Maryvale Creek, presenting the same characteristics as Photograph No. 4. The bones of some of the extinct animals are shown in the immediate foreground.

No. 8.—Here is depicted a rough method of sluicing the beds of creeks for the extraction of gold in the mountainous parts of the colony.

No. 9.—This photograph shows another method of working the beds of creeks for the extraction of alluvial gold. In the foreground are shown the operations of the well-known Californian pumps, as employed in throwing out the water from ordinary alluvial claims.

No. 10 is intended to illustrate the style of building adopted at a new "rush" on the gold fields. Here, in the first instance, bark stripped from the Eucalypti, the common tree of the country, is made to serve all kinds of building purposes, so far as the exterior of the habitations is concerned. At a later date, if the promising character of the diggings warrants a more permanent settlement, comfortable buildings of wood and stone are substituted.

No. 11 represents ordinary alluvial mining in Queensland. In the foreground the puddling tub employed in soaking the auriferous drift (if of a clayey character), and the cradle for finally extracting the gold from the concentrated débris will be observed.

Samples of soils  
and products.

The table cases ranged under the above photographic views contained the variety of soils found in various alluvial districts in Queensland. Here also, were specimens of the products, comprising cassava, arrowroot, taro, sweet potato, flour, maizena, silk cocoons, wheat, maize, barley, tobacco, &c. The larger cases on the table contained samples of the soils with analyses attached, and there was one case entirely devoted to the fossils found in the older alluvia.

The annexed table of analyses of characteristic alluvial soils from various districts in Queensland is a summary of the contents of the alluvial soils exhibited in the table cases. They were mostly chosen by the Director of the Botanical Gardens, Brisbane, as characteristic of large areas in the various districts from which they were taken.

TABLES OF ANALYSES OF ALLUVIAL SOILS from various AGRICULTURAL DISTRICTS on the East Coast of QUEENSLAND. Analyses of alluvial soils.

MECHANICAL ANALYSIS.

Mechanical analysis.

No.	Latitude.	Longitude.	Specific Gravity.	Water lost at 112° F.	Organic Matter.	Clay Oxides of Iron and Alumina.	Fine Sand, Quarts.	Total.	Organic matter contains	
									Nitrogen.	Equal to Ammonia.
1. Best scrub soil, Yellowwood Plantation, Albert River.	27 42	153 14	1.999	5.994	10.623	81.723	1.660	100.000	0.457	0.354
2. Best forest soil, Yellowwood Plantation, Albert River.	27 42	153 14	1.915	6.705	11.834	78.456	3.005	100.000	0.343	0.416
3. Forest soil, Yellowwood Plantation, Albert River.	27 42	153 14	2.375	3.676	7.907	75.050	13.367	100.000	0.214	0.259
4. Morayfield, Caboolture.	27 9	153 0	2.223	3.338	6.559	89.093	1.010	100.000	0.226	0.274
5. Iindah Estate, Maryborough.	25 30	152 41	2.185	2.660	5.202	81.538	10.550	100.000	0.236	0.236
6. Top soil, Alexandra Plantation.	21 11	149 10	2.177	2.950	5.075	70.036	21.939	100.000	0.306	0.371
7. Subsoil, Alexandra Plantation.	21 11	149 10	2.280	2.734	3.884	69.091	24.791	100.000	0.063	0.099
8. 30-inches deep -	21 11	149 10	2.308	2.354	1.631	78.282	23.533	100.000	0.022	0.028
9. Gairlock, Lower Herbert River.	18 37	146 16	2.180	2.070	4.867	91.243	1.820	100.000	0.128	0.155
10. Nind's Camp, Johnstone River.	17 32	146 3	2.394	3.618	7.470	84.052	4.860	100.000	0.288	0.349

CHEMICAL ANALYSIS.

Chemical analysis.

No.	SOLUBLE IN WATER.							
	Water at 212° F.	Organic Matter.	Oxides, Iron and Alumina.	Lime.	Magnesia.	Chlorine.	Sulphuric Acid and Alkalies.	Silica, finely divided.
1. Best scrub soil -	5.995	0.152	0.051	0.057	0.029	0.007	0.050	0.011
2. Best forest soil -	6.705	0.193	0.086	0.035	0.021	0.005	0.022	0.137
3. Forest soil -	3.676	0.100	0.055	0.033	0.019	0.012	0.013	0.063
4. Morayfield -	3.338	0.200	0.040	0.072	0.033	0.107	0.158	0.050
5. Iindah -	2.660	0.181	0.050	0.152	0.054	0.003	0.130	0.080
6. Top soil, Alexandra	2.950	0.250	0.095	0.084	0.038	0.0022	0.1358	0.085
7. Subsoil, "	2.734	0.100	0.014	0.067	0.030	0.0019	0.1521	0.015
8. 30-in. deep, "	2.354	0.080	0.020	0.073	0.034	0.0012	0.1513	0.025
9. Gairlock -	2.070	0.180	0.060	0.117	0.029	0.005	0.109	0.072
10. Nind's Camp -	3.618	0.118	0.013	0.037	0.017	0.030	0.041	0.006

(continued)

## CHEMICAL ANALYSIS—cont.

No.	SOLUBLE IN ACID.						
	Water of Con- stitution.	Organic Matter.	Equal to Ni- trogen.	Oxides of Iron.	Alumina.	Lime.	Magnesium.
1. Best scrub soil - -	3.610	10.741	0.457	6.937	7.021	1.259	1.043
2. Best forest soil - -	4.493	11.641	0.343	8.369	11.270	0.522	0.302
3. Forest soil - -	2.204	7.797	0.214	6.009	6.991	0.566	0.153
4. Morayfield - -	4.189	6.359	0.226	6.361	9.823	0.281	0.207
5. Iindah - -	2.837	5.022	0.238	3.831	5.361	0.696	0.252
6. Top soil, Alexandra	3.464	4.825	0.306	3.843	8.124	0.380	0.372
7. Subsoil, " - -	3.973	3.284	0.082	4.955	9.320	0.326	0.286
8. 30-in. deep, " - -	3.422	1.751	0.022	4.612	10.030	0.253	0.492
9. Gairlock - -	2.634	4.697	0.123	3.372	6.986	0.230	0.211
10. Nind's Camp - -	4.492	7.352	0.233	7.823	11.380	0.458	0.553

(continued)

No.	SOLUBLE IN ACID.—continued.						
	Potash.	Soda.	Sulphuric Acid.	Carbonic Acid.	Phosphoric Acid.	Silica, soluble in Alkalies.	Insoluble Silicious Re- sidue.
1. Best scrub soil - -	0.453	0.119	0.206	0.241	0.301	8.912	52.936
2. Best forest soil - -	0.269	0.317	0.175	0.101	0.221	4.377	50.739
3. Forest soil - -	0.130	0.401	0.161	0.102	0.193	3.210	68.092
4. Morayfield - -	0.421	0.119	0.178	0.012	0.149	17.554	50.299
5. Iindah - -	0.352	0.036	0.145	0.029	0.129	9.967	68.133
6. Top soil, Alexandra	0.311	0.046	0.254	0.180	0.144	9.705	65.712
7. Subsoil, " - -	0.285	0.003	0.237	0.080	0.082	7.781	66.314
8. 30-in. deep, " - -	0.263	0.083	0.226	0.100	0.081	8.550	67.388
9. Gairlock - -	0.241	0.046	0.121	0.100	0.109	13.181	65.532
10. Nind's Camp - -	0.344	0.196	0.082	Trace	0.236	12.265	50.947

## Details.

No. 1 is an *alluvial scrub soil* from "Yellowwood" plantation on the Albert river in the Moreton district of Queensland, and was selected as a typical sample of the *best scrub land* in that district.

No. 2 is an "*alluvial soil*" considered of second quality from the same plantation.

No. 3 is marked "best forest soil." also from "Yellowwood."

No. 4 is from the "Morayfield Plantation." Caboolture lat. 25° 30', long. 152° 28', the estate of Messrs. Raff & Co., one of the earliest formed sugar plantations in Queensland. It may be considered a characteristic sample of scrub soil on the Caboolture river.

No. 5 is from "Iindah Plantation" Maryborough, the estate of Messrs. Ramsay Brothers, lat. 25° 30', long. 150° 41'. It was selected as a characteristic "scrub soil" from the banks of the Mary river, along the course of which for many miles sugar cane is now being cultivated; 4 tons of sugar were made from 10 tons of Bourbon cane on this estate, equal to a gross return of 120*l.* per acre.

Nos. 6, 7, 8 are the top, sub, and 30-inch deep, soils taken from the estate of J. E. Davidson, Esq., Alexandra Plantation, Mackay, lat. 21° 11' S., long. 149° 10' E. These are characteristic alluvial soils of a considerable area in the Mackay district; they are underlaid by a coarse pebble drift affording excellent natural drainage.

The crop of sugar from 200 acres on this estate for the season 1873 was 395 tons, the gross money value would be about 11,000*l.*, or 55*l.* per acre.

No. 9 is the surface soil from the estate of Messrs. Mackenzie Brothers, Gairlock Plantation, Lower Herbert river, lat. 18° 37' S., long. 140° 10' E.

The crops taken from this estate for season 1873 yielded 2½ tons sugar per acre of a gross money value of 70*l*.

No. 10 is a sample of "alluvial scrub soil" from the junction of the north and south branches of the Johnston river, known as Nind's Camp, lat. 17° 32', long. 146° 3', and may be accepted as a typical sample of the "jungle covered alluvium" of that river, of which there are large areas, both on it and the Daintree river, as yet unoccupied by planters.

Of these soils Dr. Voelcker, the eminent chemist, thus speaks :—

Dr. Voelcker.

"All these soils are distinguished by remarkable fertility, and are naturally well adapted for the cultivation of the sugar cane. A glance at the analytical tables giving their composition clearly shows that they contain all the more important mineral elements of fertility in considerable proportions, as well as a large amount of organic matters capable of producing by their gradual decomposition, and finally by oxidation, a constant supply of nitrates which, in my opinion, are the combinations in which nitrogen is assimilated by plants.

"Thus it will be seen that the soil marked No. 1, 'best scrub soil, Yellowwood Plantation, Albert river,' contains nearly a half per cent. of nitrogen in the shape of readily decomposable organic matters or a larger proportion than was found in any of the remaining soils.

"It is very interesting and practically important to notice in the analytical tables that the large proportion (comparatively speaking) of nitrogen in the best scrub soil, No. 1, is associated with corresponding large proportions of available potash, phosphoric acid, and lime.

"The best alluvial scrub soils are not only richer in nitrogen (organic plant food) but also in the more important mineral plant constituents. The scrub soil No. 1 shows a remarkable similarity in composition, and, I may add, in appearance, to the celebrated prairie soils of Illinois, several of which I had occasion to examine some years ago.

"I gather from the report and notes accompanying these soil analyses that most of the alluvial scrub soils are of great depth. They therefore contain, practically speaking, inexhaustible stores of plant food, and with deep cultivation, and the occasional application of appropriate top dressings, no fear need be entertained that they will become gradually less and less productive, and finally be rendered infertile."

There can be no question indeed that the "alluvial scrub lands" of the East Coast of Queensland are admirably adapted for the growth of *any* agricultural product, but such products must be adapted to the climate of the district where the settler is located. Adaptability of alluvial land to agricultural purposes.

The ordinary alluvial land not covered with scrub is also of good quality for agriculture, but of course requires the application of manure at an earlier period in the cropping than the "scrub land."

On all the eastern rivers there is more or less alluvial soil, the greatest extent near the embouchures of the largest rivers, the Herbert, Burdekin, Fitzroy, Mary, Brisbane, &c., but this, though fine pasture land, is only in parts suitable for the agriculturist on account of its liability to periodical inundation.

The cause of this comparative absence of large tracts of alluvial soil, free from partial inundation on the coast, is that the whole coast of Queensland is one of subsidence.

At no great distance back in time the barrier reef formed the eastern coast line of the colony, and the outlet of the Fitzroy and Burdekin on that old coast line are as marked a feature as are their outlets on our present shore.

Had elevation taken the part of depression, vast alluvial deposits, now covered by the sea of the Inner passage, would have been available for agriculture; as it is there remain only those which border the present streams of the country, and where those streams passing through them have cut such broad and deep channels as to carry away with ease the storm waters which may be swept down them.

Large tracts, however, of such alluvials still await the plough of the agriculturist and the planter. Locality of alluvial lands.

In the Moreton district, on the Brisbane, Bremer, and Logan.

In the Wide Bay district, on the Mary and Burnett.

In the Kennedy district, on the Mackay and Herbert.  
 In the Cook, on the Johnson and Daintree.  
 Such lands are classed as agricultural, and are sold at 15s. per acre, payable in equal instalments over a period of 10 years.

Division II.—  
 Cainozoic.

DIVISION II.—CAINOZOIC.

The information given on the tablet under this head was as follows:—

*Rock.*—Sandstone and conglomerate.

*Soil.*—Coarse sand, valueless for pastoral or agricultural purposes, locally termed "Desert Country."

*Products.*—Gold has been found at the "Cape" and "Charters Towers." Diggings at its junction with the auriferous metamorphic rocks, suggesting great possible value in other districts where similar conditions are found.

*Extent.*—Approximate, 150,000 square miles.

This division is devoted to the illustration of a geological formation which has, doubtless, at one time covered the whole of Queensland, and it may be the whole of Australia, and which, had not subsequent denudation removed it over enormous areas, would have left the entire continent-island a desert waste. This has been by the geologist who described it (Mr. Daintree), termed "desert sandstone," and is supposed to represent one of the lower members of the Cainozoic group, the Eocene or Lower Miocene Tertiary of European geologists.

The results of the late expeditions undertaken and carried out in the face of immense difficulties by Colonel Warburton and Mr. Forrest in Western Australia tend to prove that a vast proportion of Australia seems still to be covered by this desert sandstone, thus rendering it quite useless for pastoral or other settlement.

Illustrative  
 photographs.

Photographs 12, 13, 14, 15, 16, and 17 furnish admirable ideas of the appearance and peculiarities of the desert sandstone. On photograph 18 are shown the so-called "paintings" of the Australian natives. These, as is abundantly apparent, are works of art of the most primitive description, being simply negatives in ochre of hands, feet, boomerangs, shields, &c. on the surface of the sandstone rock. The object is placed upon the rock and masticated ochre forcibly ejected from the mouth of the native artist leaves the imprint as described. The blacks are very active in adorning the interior of their caves, where the atmosphere does not destroy the work, with these rude designs.

No. 19 is sufficiently illustrative of the way in which denudation has rendered the country suitable for settlement. The huts in the foreground form the township at the Gilbert diggings, the flat-topped hills in the distance being capped with the outliers of the desert sandstone which at one period covered the entire district.

No. 20. Here we have the abrupt edge of the desert sandstone; it can be frequently followed for 20 or 30 miles without a break.

No. 21 shows the ordinary character of the creeks traversing the Cainozoic formation. It may here be remarked that during the summer season water is only to be found in this sandstone country at rare intervals.

No. 22. A cave in the sandstone used by a prospecting party of diggers. These caves are favourite camping places for the Australian natives, the sandstone districts containing abundance of wallaby, a small species of kangaroo, and opossums, and thus forming capital hunting grounds.

Specimens of  
 soils.

The table cases, which, in this as in the other divisions, were placed beneath the photographs, contained specimens of the soils and the rocks from which they have been derived. The only useful products are varieties of bark used in tanning, and gum resins taken from the Eucalypti.

Division III.—  
 Mesozoic.

DIVISION III.—MESOZOIC.

The information given on the tablet was as follows:—

*Mesozoic (Cretaceous).*

*Rock.*—Calcareous shales and sandstones, with bands of argillaceous limestone.

*Soil.*—Marls and light calcareous sands form the vast plains of the "Western Interior," covered with saline plants and rich herbage in favourable seasons. Excellent pastoral country where water is available.

**Products.**—Beef, mutton, wool, and tallow, opals, coprolites, hydraulic limestone, gypsum.

**Extent.**—(Approximate) 200,000 square miles.

*Mesozoic (Carbonaceous).*

**Rock.**—Sandstone, conglomerate, shale, ferruginous limestone.

**Soil.**—Varied, generally poor sandy, rarely fit for agriculture, grows scrub and fine timber; where not covered with scrub, yields grasses on which cattle thrive, but do not fatten readily.

**Products.**—Coal, iron ore, hydraulic limestone, fine timbers.

**Extent.**—(Approximate) 10,000 square miles.

This division is devoted to two separate geological formations, which are, however, embraced in the same main group by European geologists as the mesozoic. The first four photographs, Nos. 23 to 26, illustrate the cretaceous portion of the system, and the succeeding seven the carbonaceous, a part of the Mesozoic group which is probably oolitic. Their fossils, and the relative extent of each, are shown upon the map and in the cases of the division.

Photograph 23 is a view of Betts' Creek, Northern Queensland, about lat. 20 deg. 40 min. S. It affords an excellent illustration of the horizontal character of the Cretaceous series, over the enormous area of quite 200,000 square miles, which it occupies in Western Queensland, and at the same time describes the character of the strata composing it, viz., interstratified bands of sandstone and shale, with occasional beds of calcareous limestone intervening.

No. 24 gives a faithful picture of the great prairie country in Western Queensland, as taken from Marathon station, on the Flanders River, in about lat. 20 deg. 20 min. S. The soil in these plains is in every way suited for the growth of all kinds of agricultural products if the climate were only suitable. At present they are sparsely covered with native grasses and herbs of the most fattening characters, and the district is noted in all the Queensland markets for the excellent quality of the meat they yield. Cattle are taken from these downs to as great a distance as Melbourne, where the fat bullocks find a ready market. The splendid condition of the prairie-fed stock may be estimated from the fact that frequently two-thirds of the beasts, after travelling nearly a thousand miles, are still saleable in the Melbourne markets as fat cattle.

A very small extent of this formation is found on the eastern side the dividing ranges, and this in the vicinity of Peak Downs, in the Leichardt district, and in certain portions of the East Cook. Its soil corresponds in character with the chalk marls and greensands of Cambridgeshire and adjoining counties, and is very fine for agriculture or for the growth of natural grasses. Whilst, however, the extent on the east coast is very insignificant, on the western portions of the colony in the Burke and Maranoa districts it is the prevailing feature.

Here it forms those almost boundless plains which may be called the Western Prairies of Queensland, the value of which for pastoral purposes are becoming more and more appreciated.

An analysis of a sample of the soil from these prairies of the Upper Flinders River is attached.

(This soil was taken from a point on the prairies about three miles west of Hughenden Station, on the Upper Flinders.)

*Mechanical Analysis.*

Water lost at 212° F.	-	-	-	-	5.114
Organic matter	-	-	-	-	2.175
Clay, including oxide of iron, and carbonate of lime	-	-	-	-	92.526
Pure sand (quartz)	-	-	-	-	185

100.000

Specific gravity	-	-	-	-	2.445
Containing nitrogen	-	-	-	-	.081
Equal to ammonia	-	-	-	-	.098

R 2

Analyses of soil  
from Upper  
Flinders River.

*Chemical Analysis.*

Water lost at 212° F. . . . .	5.114
<b>Portions soluble in water :—</b>	
„ Organic matter . . . . .	·030
„ Lime . . . . .	·070
„ Oxides of iron and alumina . . . . .	·002
„ Magnesia . . . . .	trace
„ Chlorine . . . . .	·002
„ Alkalies, sulphuric acid, and carbonic acid . . . . .	·071
„ Finely divided silica . . . . .	·006
<b>Portions soluble in acid :—</b>	
„ Water of constitution . . . . .	3.097
„ Organic matter . . . . .	2.145
„ Oxides of iron (chiefly peroxide) . . . . .	5.491
„ Alumina . . . . .	10.311
„ Lime . . . . .	11.685
„ Magnesia . . . . .	1.088
„ Potash . . . . .	·714
„ Soda . . . . .	·305
„ Sulphuric acid . . . . .	·117
„ Carbonic acid . . . . .	7.089
„ Phosphoric acid . . . . .	·200
„ Soluble silica (set free by Alkali) . . . . .	18.193
„ Insoluble silicious matters . . . . .	34.270
	<hr/> 100.000 <hr/>

Ammonites, Belemnites, and the remains of extinct Saurians are scattered over the surface of all these "Western Prairies" of Queensland.

**Coal formations.***Mesozoic (Carbonaceous).*

Nos. 27, 28, 29, and 30 represent this formation of the mesozoic carbonaceous age. It is very largely developed in the colony of Queensland. In photograph 30 a coal seam appears cropping out at the foot of a cliff on Pelican Creek in Northern Queensland, and many such natural sections of coal have been observed through the carboniferous districts, but have as yet received little attention for economical purposes. Several coal mines have, however, been opened in the southern portion of the colony, chiefly on the Darling Downs and in the West Moreton district. The coal obtained from them has been chiefly used for satisfying local requirements; but when the railway is completed to the coast there can be no doubt that an export trade will arise. It is a well-established fact that coal in almost any quantities can be obtained within no great distance of the capital, Brisbane.

In photographs 31 and 32 a good idea is given of the character of the forests usually met with on the areas occupied by the coal formation. Dense scrubs, and timber inviting the axe-man, are the common accompaniments of the coal formation of the whole of Queensland.

Occasionally, however, this general feature is varied by open forests, of which photograph 33 is an example, and it may be as a rule assumed that these districts are very suitable for pastoral pursuits. In addition to the fossils, soils, and products, there are shown in the cases samples of gypsum and septaria. The latter are eminently suitable for the manufacture of hydraulic lime; in fact most of the limestones occurring in the cretaceous rocks of the country are suitable for that purpose.

**Division IV.—  
Palæozoic (Carboniferous).****DIVISION IV.—PALÆOZOIC (CARBONIFEROUS).**

The tablet attached to this division gave the following information :—

*Palæozoic (Carboniferous).*

**Rocks.**—Sandstone, shale and limestone, generally horizontally stratified.

**Soil.**—Various, according to composition of strata. Locally, where much limestone and shale occur, the soil is good, but as sandstone and grit prevail,

the soil is generally sandy, and rarely suitable for agriculture, except in the alluvial flats. Most of the carboniferous areas in Queensland are covered with dense scrubs of brigalow, &c. Second-class pastoral sold for 5s. per acre.

*Products*.—Coal, fire-clay, iron ore, hydraulic limestone, building stone.

*Extent*.—(Approximate) 20,000 square miles.

This division is devoted to the carboniferous group of the Palæozoic age, and the photographs are 12 in number.

Illustrative  
photographs.

No. 34 depicts the outcrop of a coal seam about 8 feet thick on Rosetta Creek, Bowen River, Northern Queensland. The Bowen River district may, as a rule, be described as one vast coalfield, numerous seams, varying in thickness and quality, having been observed in natural outcrops in various portions of its watershed.

No. 35 fairly illustrates the upper strata of this formation, which consists of sandstones and conglomerates, interstratified with occasional beds of shale. The lower members of the group consist more of limestones and shales, in which beds of fine iron ore are by no means infrequent.

No. 36 presents a remarkable example of the junction of two different geological formations at the base of the cliff. We have a series of slates and sandstones nearly perpendicular, in which are imbedded auriferous quartz strings and veins. On the denuded upturned edges of these slates occur horizontal sandstones and conglomerates of the carboniferous age. In these conglomerates, at the junction of the two formations, in certain localities of the Peak Downs, drifted gold has been found in the carboniferous conglomerates, distinctly proving that some gold, at all events, existed in the veins prior to the deposit of the carboniferous rocks.

One of the ordinary occurrences to be met with throughout the whole of the Bowen River district is delineated in photograph 37, namely, the intrusion of a dyke of volcanic rock, without any apparent movement of the adjoining strata, so common in the carboniferous rocks of England. It may be well, perhaps, to explain, for the benefit of unscientific readers, that the dyke is the feature of the picture over which a slight trickle of water is falling.

No. 38 shows the open forest country as the ordinary physical characteristic of the lower portion of the carboniferous series, and here it is that the decomposition of the rocks forms soil admirably adapted for either agricultural or pastoral purposes.

In Nos. 39, 40, 41, 42, 43, 44, and 45, we have other views of scenery characterising the upper group of the carboniferous series where sandstones are most predominant, and the soil is of inferior quality.

In No. 45 is depicted a group of cycadæ, representatives of which are found fossilized in the mesozoic group of the carboniferous rocks previously mentioned. Groves of palms, zamia, and cypas are quite common throughout most of the eastern coast country of Queensland. The fruit of the cypas, after being steeped in running water for 48 hours, is used by the Australian native as a substitute for bread. After being steeped in water it is pounded, dried, and converted into damper.

The chief objects in the table cases of soils, rock, &c., are the coal and iron ore, characteristic of the group intended to be portrayed in this division.

Specimens of  
soils, rocks, &c.

The prevailing rocks of both systems of carboniferous rocks in Queensland are sandstones, and coarse grits, yielding a barren soil, and usually covered with brigalow and other hard wood scrubs.

In some parts of the series, however, especially in the lower portions of both, shales and limestones occur, and there belts of fertile soil with rich alluviums are met with.

Such fertile belts in the coal measures make excellent selections for the farmer, as these rich alluvial bottoms can be utilised for the growth of maize, lucerne, &c., whilst the forest country affords good, sound, healthy pasture land for his stock.

The surface of fully one third of the Moreton, Wide Bay, and Burnett and Leichhardt districts on the east coast of Queensland is occupied by soils derived from the older and newer coal formations, and perhaps the area of both would not be less than 40,000 square miles.

The character of the scrub of the coal measures such as, for instance, on the road between Gympie and Brisbane, is shown in Photographs No. 31 and 32,

and the character of the open forests in carboniferous districts is well shown in Autotype No. 38.

These are the two descriptions of country the emigrant will principally meet with in the districts marked on the map as occupied by both systems of carboniferous rocks, and there can be no question that when the best coal seams are explored, and utilized for manufacturing purposes, and for export, and local mining communities are so formed, many fine farms will be formed in the coal-mining districts to supply the miners with produce.

The coal-mining area of the Bowen River, in the Kennedy district, has some fine land for occupation, and coal, iron, and limestone are abundant, and in immediate proximity to each other.

Division V.—  
Palæozoic (De-  
vonian).

#### DIVISION V.—PALÆOZOIC (DEVONIAN).

The tablet attached to this division gave the following information :—

##### *Palæozoic (Devonian).*

**Rock.**—Crystalline limestone, slate, sandstone, conglomerate in highly inclined strata.

**Soil.**—Clay or sandy according as slate or sandstone predominates. Fair pasture, naturally unsuitable for agriculture, except in the alluvial flats.

**Products.**—Gold, copper, lead, and bismuth ores, especially where the strata are broken up by the intrusion of diorite, felsite, &c. Marble abounds in the lowest rocks of this series. Building stone, roofing slates.

**Extent.**—(Approximate) 50,000 square miles.

In this division we pass to a geological formation corresponding with the so-called Devonian of Cornwall and a portion of Devon. This is, in fact, the youngest formation in which metallic minerals of commercial importance are first met with in Queensland. The extent has been estimated at 50,000 square miles, and this is probably very much below the actual area. Already ores of almost all the valuable metals have been found in this formation in Queensland, but, as suggested in the tablet overhead, only those localities broken up by the intrusion of certain trap rocks, &c., were found worthy the attention of the miner. In the lower part of the series enormous masses of limestone and marble have been discovered. In one case, in the Clark River district, Northern Queensland, the writer has ridden along a barrier of solid marble for 80 miles, with an average thickness of one mile, without any break except such as have been forced by the natural drainage of the country. Illustrations of these natural breaks are shown in Photographs 46 and 48, and samples of the marble are exhibited immediately under in the table cases.

The trend of the rocks is admirably shown by these interstratified limestone barriers, and from the top of the hill on any of these districts there is no difficulty whatever in following the strike of the beds to the extreme horizon by the line of deep tinted vegetation. Trees growing out of the chinks of the marble add to the picturesqueness of the country, the foliage invariably exhibiting large, green, glossy leaves, and the entire landscape offering innumerable subjects for the pencil of the artist. The marble in some instances extends to the coast, or rather is found in some of the islands off the coast. In one of the Cumberland group it has been quarried and sent into the colonial market; it is of a delicate cream colour. A sample of this will be found in one of the cases beneath the photographs.

Photographs 47 and 49 are points on the Gilbert River selected to illustrate the intrusion of a greenstone dyke, at the junction of which, with the slates and sandstones of the district, an auriferous quartz vein may be observed in one of the pictures. This, indeed, is invariably the condition under which mineral veins of any consequence have been discovered in the Devonian rocks of Queensland. It will be seen in Photograph 47, that the sandstone rocks on which the figure in the foreground is standing are sharply cut off by the greenstone dyke between him and the river. On the opposite side of the river the horizontal strata of the desert sandstone series cap the palæozoic rocks of the river bed, and these are the general conditions of the mining district of the Gilbert, Palmer, and Cloncurry mining districts of Queensland.

No. 50 is a view of the mining township of the Gilbert River, and this will give a pretty correct idea of the general physical character of the Devonian

Illustrative  
photographs.

formation as developed in Queensland, gently undulating, lightly timbered, and scantily grassed, but still forming country suitable for pastoral occupation for stock-breeding purposes.

No. 51 is a section illustrative of the rocks of the group and general angle of dip developed throughout the whole country. Sandstones, limestones, and slates interstratified make up the entire formation.

Nos. 52, 53, 54, 55, and 56 show the varied physical characters of the same district. In No. 53 mining on a line of reef on the upper Cape district in Queensland is portrayed, the hill in the distance being a massive dyke of porphyry, and the flat ground occupied by slates, &c. At the intersection of these the line of reef has been followed, and was for a long time profitably worked.

In the table cases varieties of soil from the limestone districts and polished specimens of the limestones themselves are exhibited; also varieties of soil from districts where slates, sandstones, &c. abound, and the rocks from which the soils have been derived. There also may be seen illustrative examples of the different ores which have been exploited in the Devonian rocks. Here too are shown samples from the great Australian mine of the Conclurry River, a branch of the Flinders in Northern Queensland.

It will be found on examination that the ores from this "Great Australian" mine are of the richest possible character, exemplifying as they do the masses at the mine, of metallic copper, red oxide, and carbonate. This is only one of a number of most valuable copper lodes which have been discovered in the same district, but at the present time they remain unworked on account of the distance from a shipping port, a drawback which time and increased facility of transit will ultimately remedy. It is asserted on the best authority that these are the most valuable mines of copper which have yet been discovered in Australia.

Specimens of  
soils, stones,  
ores, &c.

Adjoining these valuable specimens are to be seen samples from the Star River, in the Kennedy mining district, about 80 miles from the port of Townsville. This also is representative of one of a group of copper lodes recently discovered in the Star River district, and which promises to afford a large and permanent export of copper in the future.

There are further shown samples of copper ore from various outcrops in other parts of Queensland, for example, the Dee copper mine near Rockhampton, the copper mine near Nebo in the Broadside district, and other small outcrops in the south of the colony on which sufficient work has not yet been done to prove their value as permanent mines. Samples of manganese ore are shown in the same place; one of these, from the immediate neighbourhood of the township of Gladstone, contains according to careful analysis about 77 per cent. of peroxide of manganese.

#### DIVISION VI.—METAMORPHIC.

Division VI.—  
Metamorphic.

The tablet over this division gave the following information :—

##### *Metamorphic.*

*Rocks.*—Mica and hornblende, schist and quartz rock.

*Soil.*—Sandy or cold clay, unsuitable for agriculture except in the alluvial flats; natural grasses have little or no fattening properties. All such country would be rated second-class pastoral, and would be sold at 5s. per acre.

*Products.*—Gold, tin, copper, lead, &c. Lodes of various kinds are found in all the areas in Queensland occupied by metamorphic rocks, especially where penetrated by "Elvan Dykes."

*Extent.*—(Approximate) 50,000 square miles.

The character of this division is sufficiently indicated in the above compilation, and the photographs from 57 to 67 illustrate the physical character of the formation, which is a most important one to the future of Queensland. Lodes of all kinds of mineral have been discovered throughout its entire extent, and they are apparently not so much dependent on the intrusion of volcanic dykes as in other systems, such as the Devonian, to which a previous division was devoted. In addition to the copper and gold which are the chief materials found to be associated with the Devonian rocks, ores of tin, antimony, bismuth, and lead have been discovered in the Metamorphic, and fresh discoveries are being made almost daily.

Illustrative  
photographs.

Photographs 57, 58, 59, and 60 indicate the nature of the level country of the metamorphic districts, which is usually covered with open forests containing valuable but by no means largely growing trees. The wood is very sound and good, but the timber is as a rule somewhat small in size.

In No. 61 we have an example of the desert sandstone resting immediately on the top of perpendicular cliffs of metamorphic schist.

In No. 62 a section of the ordinary mica and hornblende schists with their interlaminated quartz veins and strings are well shown. The view is taken from the junctions of the Copperfield and Lynd rivers, Northern Queensland. The distant peak on the left is a hill of porphyry, at the intersection of which with the mica schists, &c., mineral land is generally to be expected.

No. 63 is taken from the top of the Black Mountain of the Cape River district, and admirably exemplifies the mode in which the physical outline of the country is determined by the strike of the more or less indurated character of the rocks which made up the geological formation. On the left is a steep range formed by a barrier of extremely hard quartzite, the trend of which may be easily followed for quite a hundred miles. The valley between the two ridges has been easily denuded by the removal of very soft mica schists, abutting on much harder hornblende schists. These have been shown to resist denudation only in a degree somewhat inferior to that of the quartzites, as exemplified in the mammillated ridge immediately on the right of the picture. The artist himself is sitting on a hill which has been formed by a dyke of volcanic rock traversing these at right angles.

Nos. 64, 65, 66, and 67 are views taken promiscuously from various points of the metamorphic districts in Queensland.

Specimens of  
soils and rocks.

The usual specimens of soils and rocks appeared in the table cases, and in a series of small bottles there were stored varieties of alluvial gold from various Queensland diggings. In this collection there were also specimens of drift cinnabar, carbonate of bismuth, tin ore, garnets, zircons, rubies, topazes, &c. In other compartments were samples of the different copper ores found in this formation in Queensland.

Amongst the soils, &c. in the table cases were samples of copper ore from the Mount Perry mine in the Burnet district. During last year this mine paid to its shareholders a dividend of 80 per cent. on the actual paid-up capital. It forms one of a group of lodes lying in the same locality, and they will all probably be worked with profit as soon as the railway is completed with the port of Bundiburg on the Burnet River, a scheme which is now under consideration by the Parliament of Queensland. Specimens from the Normanby, one of the mines of the same group, were shown in the adjoining case, and samples of black oxide, carbonate, red oxide, and pyrites, ores from the Peak Downs mine. From this mine, copper to the value of one million pounds has already been shipped, and active work is still continued in that and other mines of the same district. Ores from the Maxford mine in the Broadsound district were shown next to the compartment which holds the specimens from Mount Perry mine. Some very good ore was taken from the surface of this mine, but it has not been found to be productive at any depth.

Division VII.—  
Granite.

#### DIVISION VII.—GRANITE.

The illustrative tablet gave the following information:—

##### *Granite.*

*Rock.*—Granite, syenite, &c.

*Soil.*—Various, according to composition of rock, generally poor sandy; on the ridges sometimes of fair quality for agriculture in the alluvial flats, where syenite contains much hornblende soil of better quality.

Fair pasture on the whole, would be classed second-class pastoral, and sold at 5s. per acre.

*Products.*—Molyden, glance, tin ore, auriferous quartz, building stone.

*Extent.*—(Approximate) 70,000 square miles.

It is likely that the area given in the above tablet is excessive, as it has been found by recent exploration that much of the country supposed to be granite in the Cape York peninsula is occupied by metamorphic rocks, and is now being extensively worked for gold and other commercially valuable minerals.

Several of the photographs in this division furnish a characteristic outline of the weathering of granite. Nos. 72 to 79 illustrate the scenery of the comparatively level country. The natural grasses in the granitic districts of the colony are not ordinarily of a fattening quality; such districts are, therefore, mostly taken up by pastoral settlers who, in the breeding of cattle, have found the country to be of the most valuable kind, and the young stock enjoy a comparative immunity from pleuro-pneumonia. Where, however, granite country lies near the coast, so that stock depastured on it can have access to salt pans and the saline herbage around them, cattle fatten very rapidly.

Illustrative  
photographs.

The table cases afforded the usual practical illustrations of what the granitic area produces. Most worthy of note were the specimens of tin ore from the Stanthorpe district, from which, during the last three years, tin ore equal in quantity to about one half the amount raised in Cornwall and Devon has been annually shipped to European markets. There were also to be seen specimens of the alluvial drift in which the tin ore occurs.

Specimens of  
tin ore.

#### DIVISION VIII.—TRAPPEAN.

Division VIII.—  
Trappean.

The term trappean has been adopted to express that form of volcanic action which is represented by the pipes or cores of rock in connexion with which volcanic matter may or may not have reached and overflowed at the surface. Certain forms of these trappean rocks have been found to be of the greatest importance in Queensland, with reference to the mineral lodes of the country, especially throughout the areas occupied by the Devonian rocks. It is at the intersection of these with palæozoic, metamorphic, or granitic rocks that the most valuable minerals have been discovered in the colony.

Trapdykes are, commonly speaking, of two characters. The basic traps as influencing mineralization are usually hornblende syenites or diorites; if acid, felsites or felspar porphyrys. The basic traps are usually associated with basic rocks; the acid traps with acid rocks; that is to say, the diorites are more commonly found in the Devonian rocks in which limestone and calcareous slaty beds abound, and the acid traps are usually to be found in gneiss, quartzite, and mica schist of the metamorphic series.

Photographs 81 and 82 afford characteristic views of the structure of these diorites as represented in the bed of the Gilbert River, near its junction with the Percy. This particular dyke is especially massive, and in some places half a mile broad; but at its junction with the metamorphic rocks of the district, it has been found on both sides to furnish auriferous quartz veins, and both the bed of the Gilbert and its smaller tributaries have yielded alluvial gold in paying quantities, in its immediate vicinity.

Illustrative  
photographs.

The ordinary appearance of the country occupied by trap rocks is shown in Photographs 80 and 83. It is lightly timbered, possesses gently undulating ridges, and a stiff ferruginous clay suitable for both agricultural and pastoral purposes; and Photograph 85 shows that, where of sufficient extent, it is admirably adapted for the latter.

Trap rocks.

No. 86 is a trap dyke cutting through desert sandstone on the Gilbert River district. This dyke is a dolerite, and that is a type very common through both of the carboniferous systems of Queensland, but in no case have dolerite dykes been found associated with mineralising action there.

No. 88 is a view of the Black Mountain in the Cape River district, and is an instance of the intrusion of a dolerite dyke through the metamorphic schist of the district. Here, however, no mineralising action has occurred.

Nos. 89, 90, and 91 are illustrations of the intrusion of felsitic and felspar porphyry dykes. The peculiar dome-shaped appearance of the rocks depicted in these photographs is quite characteristic of this kind of plutonic disturbance, which has extended over the entire eastern districts of Queensland.

No. 89 is a view of the well-known glasshouse mountain lying to the left of the road between Brisbane and Gympie; and No. 90 is an equally well-known land mark, Mount Wheeler, about 15 miles from Rockhampton, at the base of which the Cawarral diggings have been and still are extensively worked. The intrusion of this Mount Wheeler felsite in fact seems to have been the parent of the auriferous reins so extensively worked at its base, but in rocks quite foreign to itself.

No. 91 represents the domite hills named Scott and Roper's Peak by the traveller Leichardt in his first exploration of the Peak Downs district. They

are eminently characteristic of the outline of numerous such hills on the eastern seaboard of Queensland.

Serpentines  
exhibited.

Attention may be directed to the set of polished serpentines, since serpentine of almost every known variety and tint can be obtained in any quantity in several Queensland districts.

Metallic ores.

Examples of the useful metallic ores found throughout the system were given in the wall cases, *e.g.*, the chrome iron ore found near Ipswich is in a serpentine district, which is said to occur in almost inexhaustible quantities; this ore was exhibited by Mr. John Harris of Ipswich. The specular iron from the Gilbert River; this ore is found in all the diorite districts of Queensland in veins of more or less thickness and persistency, and is one of the troubles of the miners, who find it a difficult task to free their gold from the heavier metallic substances with which the more precious mineral is associated.

Copper ore.

There are also samples of the extremely rich copper ore found in the serpentine district near Princhester, the assay of which gives 65 per cent. of metallic copper. Adjoining this are samples of copper ore from the Dotswood mine in the North Kennedy district of Queensland. The ore occurs disseminated in the form of metallic copper throughout a trap dyke, and also in quartz veins in the same, in a somewhat similar to that of the copper ore of the Lake Superior district of Canada. Small bosses of metallic copper, weighing as much as 25 lbs., have been found in the exploration of this mine. Somewhat resembling this in its mode of occurrence is that of the Byerly mine about 40 miles south of Rockhampton. The assay of this ore is as high as 38 per cent.; lying as it does at the intersection of a trap dyke with the adjoining country, it was found on exploitation to be very difficult to follow; the lode which appeared solid on the surface, breaking up into numerous thin irregular veins when followed in depth. Specimens of hyalite and semi-opal are here to be seen from the neighbourhood of Bottletree Creek, near Springsure. Fine specimens of noble opal have, though rarely, been found in the district, and this form of silica is by no means uncommon in other acid dykes of this series.

Building  
materials.

From the rocks of this series also the natives of Australia have been accustomed to obtain most of their stone implements. They yield also most ornamental and durable building materials. The soils of the Basic traps are usually either black or red in colour. The latter is due to the excess of iron, and probably in all cases to excess either of hornblende or olivine in the parent rock. The acid series, felsites, felspar, porphyry, &c., yield on disintegration soils of a comparatively inferior character for either agriculture or the pasture of stock.

On the whole, however, the trap country of Queensland may be said to be one of the best guides to the successful explorer, whether he be on the lookout for mineral, pastoral, or agricultural settlement, for it is a guide to the volcanic districts which are most especially adapted to agricultural and pastoral occupations; to the miner it is an almost unerring finger-post to success.

Division IX.—  
Volcanic.

#### DIVISION IX.—VOLCANIC.

##### *Volcanic.*

*Rock.*—Dolerite, ash, tufa, &c.

*Soil.*—Rich black clay-marl very suitable for agriculture, also fine pastoral land.

*Products.*—On "Darling Downs," wheat and other cereals, vines and fruits of Southern Europe, cotton, cane, &c. Wool, beef, and mutton on both. Copper has been found as metal and ore in the Volcanic rocks of the Bowen River and Collaroy ranges; agates in large quantities, Agate creek, Gilbert River.

*Extent.*—(Approximate) 20,000 square miles.

Illustrative  
photographs.

Photographs 93 to 101 are typical of the volcanic districts of Queensland. For example, in No. 93, which is a view taken near the Lolworth Station in the North Kennedy districts, we have the level richly grassed plains common in such districts surrounding an isolated pinnacle of granite which formed an island in the sea of lava that originally flowed around it. These conditions are

common to all the volcanic districts in Queensland; the lava-flows filling up the old valleys in the neighbourhood of craters from which their material was derived.

No. 94 is a view illustrating nearly the same physical conditions as the above, near the township of Springsure.

No. 95, taken from near Bluffdowns Station on the Basalt River, illustrates the well-watered type of the volcanic districts.

No. 96 is a view from near the head of the same stream. It is frequently experienced that permanent springs of water are found at the heads of creeks in volcanic districts, capable of supplying a running stream throughout the whole of the year, and filling all the watercourses connected with them, for a long distance from the source of supply. Especially is this the case where beds of volcanic ash are interstratified with porous basalt, and the beds have a gentle inclination from the crater. Natural artesian springs are thus formed, supplying permanent water to the districts which, had all the lava-flows been of a porous character, without the intervention of impervious beds, would have probably been waterless during the dry season.

No. 97 (and also 99) is a portion of the Peak Downs, near the Wolfgang station, with one of the before-mentioned domite peaks in the distance. This country has been admirably described by Leichardt in his book of travels descriptive of his first passage through the country. On the Peak Downs the soil is of the richest character, and the native grasses are of the most fattening description. About three-quarters of a million of sheep are at the present time depastured upon them.

No. 98, however, expresses in the most characteristic manner the ordinary appearance of the Downs country of ordinary volcanic areas in Queensland. The downs are usually those portions of such areas where the rock has been much more easily decomposed than the generality of the "basalt" of which these districts have been formed. The harder beds of lava and those more difficult of decomposition are covered with thinly timbered forest country; the soil being shallow and mixed up with rocky boulders, which, though suitable for pasturage, is comparatively unfit for cultivation.

No. 100. This view, which was taken from the Maryvale Station, in the North Kennedy district, is a good average illustration of the physical character of the open country in volcanic districts of the Upper Burdekin, Northern Queensland. It is in latitude 19 deg. 30 min. S., and at an elevation of 1,600 feet above the level of the sea. In the garden attached to the homestead were grown pumpkins, sweet potatoes, English potatoes, cabbages, lettuce, yams, maize, sorghum, beans, peas, pine apples, oranges, peaches, lemons, mulberries, vines, &c. Whilst this photograph is fairly characteristic of the Downs country adjoining the watercourses of the volcanic districts of Queensland, No. 101 is quite as representative of the rocky table lands.

Volcanic rocks and soils were sampled in the cases, and among the specimen products were those of agate, cornelian, and various kinds of silica. These are found in connexion with such rocks, and notably is this the fact on Agate Creek in the Gilbert district, where enormous quantities of agates freed from the matrix are scattered over the surface. Copper and copper ores are also found filling cavities in some localities, notably in the Basalts of the Bowen River district.

Specimens of  
soils and mine-  
rals.

An analysis of five samples of soils derived from basic volcanic rocks of Queensland, which were exhibited in the table cases in this division, is appended.

No. 1. From the Government Penal Establishment, St. Helena, in Moreton Bay, is that in which experiments in cane growing has been for a series of years carried on successfully.

No. 2 is from the Ormiston Plantation, the property of the Honourable Louis Hope, the pioneer sugar planter of Queensland.

No. 3 is soil taken from near the Killarney Station on Darling Downs, and it and No. 5 may be considered as fair typical representatives of the "black soils," of the "Volcanic Downs" country in Queensland.

No. 4. From the "Queen's Park," near Ipswich, is a "black soil," derived from the decomposition of a local intrusion of basalt near that town.

Analysis of soils.

## ANALYSIS of SOILS derived from the decomposition of Volcanic Rocks in Queensland.

	Latitude.	Longitude.	Specific Gravity.	Water lost at 212° F.	Organic Matter.	Clay, Oxides of Iron, and Alumina.	Fine Sand Quarts.	Total.	Organic Matter contains	
									Nitrogen.	Equal to Ammonia.
Government Penal Establishment, St. Helena (red soil).	27 24 153 15	2 351	1 746	4 117 75 886	18 251	100 000	0 084	0 103		
Ormiston Plantation, Cleveland (red soil).	27 30 153 16	2 445	2 639	4 446 92 095	820	100 000	0 041	0 049		
Wheat soil, Killarney, Darling Downs (black soil).	—	—	2 294	5 769	4 200 72 638	17 393	100 000	0 072	0 087	
Queen's Park, Ipswich (black soil).	—	—	2 130	13 523	4 220 77 977	4 280	100 000	0 137	0 166	
Near Jimbour Station, Darling Downs (black soil).	—	—	2 329	9 150	2 699 83 749	4 402	100 000	0 061	0 074	

## CHEMICAL ANALYSIS.

	SOLUBLE IN WATER.							
	Water at 212° F.	Organic Matter.	Oxides, Iron, and Alumina.	Lime.	Magnesia.	Chlorine.	Sulphuric Acid and Alkalies.	Silicas, finely divided.
St. Helena - - -	1 746	0 110	Trace	0 084	0 023	0 0005	0 1635	0 020
Ormiston - - -	2 639	0 110	Trace	0 089	0 029	0 017	0 114	0 051
Wheat soil, Killarney -	5 769	0 124	0 101	0 094	0 003	0 002	0 288	0 080
Wheat soil, Queen's Park	13 523	0 158	0 046	0 056	0 036	0 005	0 054	0 047
Wheat soil, Jimbour -	—	0 089	0 035	0 067	0 034	0 008	0 101	0 075

(continued.)

	SOLUBLE IN ACID.						
	Water of Constitution.	Organic Matter.	Equal to Nitrogen.	Oxides of Iron.	Alumina.	Lime.	Magnesia.
St. Helena - - -	2 564	4 007	0 064	20 366	14 628	0 117	0 070
Ormiston - - -	6 001	4 336	0 041	16 765	24 540	0 054	0 070
Wheat soil, Killarney -	3 035	4 076	0 073	6 727	11 011	0 369	0 269
Wheat soil, Queen's Park	7 696	4 062	0 137	9 553	11 934	1 368	2 128
Wheat soil, Jimbour -	4 352	2 610	0 061	9 283	12 156	1 856	1 081

(continued.)

	SOLUBLE IN ACID—continued.						
	Potash.	Soda.	Sulphuric Acid.	Carbonic Acid.	Phosphoric Acid.	Silica, soluble in Alkalies.	Insoluble Silicious Residue.
St. Helena - - -	0 100	0 191	0 082	Trace	0 073	13 719	41 266
Ormiston - - -	0 097	0 041	0 219	Trace	0 044	16 025	28 759
Wheat soil, Killarney -	0 223	0 116	0 271	Trace	0 057	17 944	40 416
Wheat soil, Queen's Park	0 099	0 077	0 042	0 129	0 060	26 236	23 691
Wheat soil, Jimbour -	0 454	0 218	0 054	0 484	0 343	25 687	31 863

The table of analysis of volcanic soils does not give the determination of the portion insoluble in acid, and therefore hardly expresses their full value to the agriculturist.

The analyses of three varieties of Queensland "basalt" (for under this technical term the rock from which these soils has been derived is generally known in the Colony) are therefore added to show what the comparatively unaltered rock is composed of, and how rich it is in all the mineral ingredients required for the perfecting of grain and grasses.

No. 1 is from the Black Mountain in the Cape River district, and is composed of a micro-crystalline felspathic and augitic base in which occur numerous isolated crystals and crystalline aggregations of augite, olivine, and magnetite.

No. 2 is from the "native cat-scrub" in the Rockhampton district, and is composed of a micro-crystalline felspathic and augitic base, in which occur large crystals and crystalline aggregations of triclinic felspar.

No. 3 is from near Jimbour Station on Darling Downs, and is composed of a base which was probably nearly all augite, but which from decomposition has become almost opaque, thickly studded with incomplete crystals of triclinic with some mono-clinic felspar.

All these so-called "basalts" are mixtures in various proportions of triclinic felspar, augite, olivine, and magnetite, in equally varying conditions of structure; sometimes the augitic portion is in excess, sometimes the felspathic; when the former, the rock is more basic, when the latter, more acid (that is, contains more silica), the quantity of magnetite in each rock of course modifying this deduction.

It may probably be held to be a fact that the *red* soils in volcanic districts are derived from the basalts containing a large proportion of olivine or augite or both.

The *black* soils originate from the more felspathic series.

ANALYSES OF TYPICAL QUEENSLAND "BASALTS," from which the *black* and *red* Volcanic Soils of Queensland have been derived. Analyses of basalts.

—	Black Mountain, No. 1.	Native Cat, No. 2.	Jimbour, No. 3.
Silica - -	44.801	55.801	57.870
Alumina - -	19.441	16.147	14.086
Ferric oxide - -	4.908	2.265	1.801
Ferrous oxide - -	8.413	6.818	9.450
Lime - -	9.632	7.466	6.160
Magnesia - -	5.694	3.149	2.902
Potash - -	1.505	1.756	1.408
Soda - -	3.878	4.305	3.429
Phosphoric acid - -	—	0.448	0.832
Carbonic acid - -	—	0.340	—
Sulphuric acid - -	—	0.360	0.404
Loss on ignition - -	1.716	1.146	1.550

To show the action of atmospheric decomposition on these "basalts," and the value of their exposure to this influence, to the agriculturist, a comparative table of the analysis of the Jimbour rock and the soil derived from it is appended.

The water lost at 212° has been eliminated in the calculation of the analysis of the soil.

It will be observed from this that whilst only about one-fourth of the rock is decomposed by hydrochloric acid, two-thirds of the soil is in this condition.

That the main difference between the rock and the soil is the loss of alkaline earths and alkalies by the percolation of carbonated waters, and the substitution of water in their places; the felspars and augites of the rock passing into clays and zeolites in the soil.

The protoxides of iron in the augites and olivines of the rock passing into per-oxides in the soil, and determining by their abundance or otherwise the colour of such soil.

	Jimbour Rock, soluble in Acid.	Jimbour Rock, insoluble in Acid.	Jimbour Soil, soluble in Acid.	Jimbour Soil insoluble in Acid.
Soluble silica (set free by alkali)	9'201	—	28'353	—
Silica	—	48'689	—	27'944
Alumina	2'608	11'478	13'419	1'469
Ferri oxide	1'474	'336	10'218	—
Ferrous oxide	4'651	4'799	—	'996
Lime	1'890	4'340	2'118	2'000
Magnesia	1'406	1'407	1'227	'881
Potash	'154	1'254	'409	'453
Soda	'158	3'273	'239	1'290
Phosphoric acid	'387	'446	'377	'000
Carbonic acid	Trace	—	'533	'000
Sulphuric acid	Trace	'494	'089	'251
Organic matter	Trace	—	2'971	—
Water of constitution	1'559	—	4'790	—
	23'506	76'496	64'806	35'194
	100'000		100'000	

## Division IXa.

## DIVISION IXA.

Geological map  
of colony.

This division was devoted mainly to the display of the geological map of the colony of Queensland, and on it were marked in distinctive colours the areas occupied by the various geological formations represented in Divisions I. to IX.

It could only, of course, be accepted as an approximate estimation of such distinctive areas, as very much remains to be done before any such delineation can approach the reality; it is hoped, however, that by its aid, and the description which has been given of Divisions I. to IX., and the specimens of rock soils and products arranged in the table cases, a fair idea of the geology, physical characteristics, and natural productions of Queensland might be arrived at by the visitor to the Queensland Court at Philadelphia.

## Division Xa.

## DIVISION XA.

General map of  
colony.

In this division the wall space was occupied by the general map of the colony, showing the position of the various gold, copper, and other mining districts, and detailed maps of some of these were exhibited under the general map.

The table cases contained representative specimens of ores from these mining areas represented on the map.

Gold fields.

The gold fields of Queensland are very numerous, and have in fact been discovered at intervals on the slopes on either side the main dividing range which separates Eastern and Western waters, and also on spurs of the range which forms the watershed to the Gulf of Carpentaria.

The names of these gold fields are Talgai, Gympie, Kilkivan, Calliope, Canoona, Cawarral, Morinish, Peak Downs, Cape River, Charters Towers, Ravenswood, Star River, situated on streams running to the East Coast; and Etheridge, Gilbert, Palmer, Cloncurry, on tributaries of rivers falling into the Gulf of Carpentaria.

Produce of gold-  
fields.

It is difficult to arrive at the produce of these gold fields either in detail or in the aggregate, as there is now no duty on gold in Queensland.

The banks, however, which buy most of the gold produced, always report the same when exported to the Customs.

The yield of gold alone from this source would in 1874 be about one million sterling, but in 1875 this amount would be greatly increased owing to the large produce from the Palmer diggings, which during 1874 exported from the port of Cookstown alone gold of the value of more than 500,000*l*.

The alluvial deposits in which gold has been found in Queensland have hitherto been very shallow, and therefore easily rifled of their contents; the river beds, however, which can only be worked during the dry season, will probably for years afford subsistence wages to parties of miners, a portion of whose number may either be engaged opening auriferous quartz veins, or prospecting for more remunerative alluvial deposits in other portions of the same district.

It is to the auriferous quartz veins in all these districts that the principal attention is now given, and there can be no doubt that these will afford remunerative employment to miners for centuries, especially when a more economical system of mining is adopted, and the facilities for conveying mining plant to the various mining centres are increased by railway communication.

The average yield from the auriferous quartz veins in the colony has always stood very high as compared with that of other Australian colonies. Auriferous quartz.

The yield per ton of the Gympie quartz up to 1870 was at the rate of  $2\frac{1}{2}$  ozs. per ton, and the statistical register for the colony gives the following as the average of some of the gold fields previously mentioned for 1873:— Its quality.

**RETURN of the AVERAGE YIELD from AURIFEROUS QUARTZ** crushed, in 1873, on the several Gold Fields where Crushing Machines were in operation. Average yield.

Total tons, 80,064; total produce, 139,527 ozs.; average yield per ton, 1 oz. 14 dwts. 20 grs.

The total quantity of gold raised at Gympie from the date of its discovery in 1867 to 31st December 1874, has been 380,825 ounces, which, valued at 3l. 10s. per ounce, gives a yield of 1,332,872l.

The following particulars respecting one of the quartz claims of Gympie was given in the "Queenslander" of February 20th, 1875.

"The half-yearly meeting of the shareholders of Nos. 7 and 8 Monkland was held on the 10th instant. This claim has now been formed into a company under the Limited Liability Act, with a capital of 75,000l. in 15,000 shares of 5l. each; 14,000 shares are allotted to the present shareholders, and the remaining 1,000 are kept as a reserve fund. From the balance sheet submitted we gather the following particulars:—Proceeds of gold for the half-year, 15,026l. 14s. 8d.; to amount paid away in dividends, 7,500l.; wages and working expenses, 3,186l. 8s. 3d.; carting, crushing, and assaying, 1,143l. 5s. 3d. From the manager's report we learn that the claim has crushed during the half-year 1,818 tons of quartz for a yield of 4,257 ozs. of gold; the cost of raising the stone has been about 2l. 2s. 9½d per ton, including dead work. The reef was struck in the company's deep shaft at 348 feet from the surface, and sinking was continued to the depth of 372 feet; levels were put in north and south of 360 feet, from which level 66 tons 5 cwt. of quartz obtained yielded 989 ozs. The main drive at the 247-foot level was broken through to the Nicholls' workings on the 8th January. There is a block of quartz left to stope out, which is expected will take from five to six weeks; the stone is considered good. Sinking was recommenced in the winze from the 247-foot level on the 4th December, and since then 26 feet (making the total depth from the 247-foot level 68 feet) have been sunk. The directors' report states that "although the dividends declared for the past-half year have not been so much as on previous occasions, we consider there is no ground for discouragement, inasmuch as, when the machinery is completed, we expect the lower levels to be highly remunerative. Had we not had the machinery to pay for, we should have been able to divide 1,849l. more than what has already been paid in dividends. For the information of shareholders, we may state that your secretary informs us that from the commencement of the claim there has been raised and crushed 7,847 tons of quartz, for a return of 28,572 ozs. 11 dwts. 18 grs. of gold (melted); and paid in dividends, 77,130l. 11s." The following are the returns from the claim from May 1, 1872, to December 18, 1874, 7,028 tons, 24,406 oz.

Although the Gympie gold field has undoubtedly borne away the palm at present from the other Queensland gold fields for the extreme richness of some of its auriferous quartz, still others, especially in the North, are becoming quite as attractive to the miner, from the more uniform and yet highly remunerative returns from the auriferous lodes opened there; these are Ravenswood, Charters Towers, Etheridge, and Palmer. Gold fields. Descriptive notice.

**Ravenswood  
gold field.***Ravenswood*

Has at present a population of about 700, and produces about 20,000 ounces of gold per annum, which could be very largely increased if the pyritous ores which are there associated with the gold were treated by the skilled metallurgist.

The present crushing power on the field is 64 stamps; the reefs occur in syenitic granite; their number and extent is given in the mining map of Ravenswood, constructed by Mr. T. R. Hacket, the late resident Government Gold Commissioner, which was displayed in Division XA.

**Charters Towers  
gold field.***Charters Towers*

Is distant from Townsville about 100 miles. Its present annual yield of gold is about 60,000 ounces; its population is between 2,500 and 3,000. The crushing power on the field is 79 stamps. The following return of crushings from the principal reefs during 1873, 1874, and to June 1875, will indicate the value of this field as a permanent mining district:—

Total crushings for the year 1873, 59,835; 1874, 50,212; to June 25, 1875, 22,601. By escort, 1873, 74,145; 1874, 62,345.

N.B.—The escort returns include alluvial gold collected on the gold field, and so give the total yield of the metal from all sources.

**Etheridge gold  
field.***Etheridge.*

The Etheridge gold field is distant from Townsville about 350 miles, from Cardwell 190 miles, and from Normanton 200 miles.

It draws its supplies chiefly from the latter port; the Government escort, however, conveys the gold produced on the field to Cardwell for shipment.

Its population is about 500; the production of gold is at the rate of 25,000 ounces per annum.

This might be increased to a large extent if the mines were worked with more capital, and some of the rock-drilling machines in such common use in America were substituted for the present hand drilling.

Indeed, no great increase in the production of gold can be hoped for from such fields as Ravenswood, Charters Towers, and Etheridge, where the auriferous lodes are walled by granite or syenitic granite, unless drills driven by machinery are brought into play.

**Palmer gold  
field.***Palmer.*

This gold field is distant from Townsville about 500 miles, and from Cooktown 150 miles.

The population, of which about two-thirds are Chinese, is estimated at 14,000.

Unlike the other gold fields of Queensland, its alluvial gold has not yet been all worked out; during 1875 the miners engaged on the Palmer and its tributaries secured some 150,000 ounces of gold, none of which was the produce of auriferous reefs.

Now, however, attention is being paid to the reefs of the Palmer district, which are said to be numerous, especially in the neighbourhood of Maytown, and it is asserted that the field will afford permanent and remunerative occupation for quartz miners for many years.

The mining maps of Gympie, Ravenswood, and some other gold fields, were exhibited in Division No. XA., with specimens of the auriferous lodes from most of the Queensland gold fields.

**Tin mining.***Tin Mining.*

Early in 1872 discoveries of drift tin ore were made in the southern portion of Queensland near the borders of New South Wales, and since that period a supply has been obtained from this locality, which is known as the Stanthorpe district, at the rate of about 5,000 tons per annum, equal to about one half the English production for the same period, and about one-sixth of the total production of the world.

Although tin ore has only yet been worked in Queensland in the Stanthorpe district, it is known to exist in several other localities, for example on tribu-

taries of the Star river and on the Western creek, and is especially plentiful in portions of the Palmer district.

The present low price of tin, and the cost of conveyance to a port of shipment from the last-mentioned locality, has, however, kept any of this ore from being thrown on an already glutted market.

A map of the Stanthorpe district and full report on the same were shown in Division XA.

### *Copper Mining*

Copper mining.

Has attracted great attention in Queensland for several years on account of the great success of the Peak Downs mine.

This mine commenced operations in 1865, and had in the outset great difficulties to contend with. The principal one was, that Rockhampton, the port first used for shipping the copper, was 278 miles distant from the mine.

At the end of 1872, however, more than 1,000,000*l.* worth of copper had been smelted and sold, and more than 200,000*l.* had been paid in dividends.

Active operations are still being carried on there, and other centres for copper mining industry have since been discovered.

These are chiefly the Mount Perry (about 70 miles from Maryborough) and the Conclurry, from both of which districts large supplies of copper may be depended on as soon as cheap carriage to the seaboard is assured.

Specimens from these and numerous other copper lodes in all parts of Queensland will be found in the centre of the Court opposite this division, and it may safely be asserted that Queensland may be depended on in the future for the continuous supply of large quantities of this metal.

### *Coal Mining*

Coal mining.

Is quite in its infancy in Queensland; the colony however possesses a very large extent of the carboniferous rocks; with interstratified coal seams of varied quality and thickness, which in future years will doubtless be one of her most reliable sources of wealth, and will afford remunerative employment for a large settled population.

The extent and position of her coal fields were shown in the mining map in Division No. A, while samples of the coal from the few mines at work were exhibited.

## **DIVISION X.—MINING.**

Division X.—  
Mining.

It is only within the last few years that mining exploration has been systematically carried on in Queensland. Every month tends to show increasing activity in this direction, and increasingly satisfactory results. In 1864 the exports of all mining produce from Queensland amounted only to 87,000*l.*; in 1874 they amounted to more than a million and a half.

Photographs 102 to 112 are devoted to the illustration of some phases of mining life and mining operations in Queensland. In No. 102 we have depicted the ordinary rough accommodation of a prospecting party of diggers. Their hut, constructed in 48 hours, though sufficiently comfortable for the climate, is certainly not luxurious in appearance, nor indeed in reality, but the miners themselves give evidence that the toilsome and rough life which they have chosen does not injure their health or temper. They are representatives of the stalwart men who are found in thousands preferring this work to that of any other, and rejoicing in what many would consider unbearable hardships. The stock in trade of an ordinary alluvial miner is on view around the hut; viz., the pick, shovel, tin dish and cradle, and, as cleanliness is said to rank perhaps before godliness with the Australian digger, his outfit is not complete without his bar of soap and rough jack-towel, as shown in the photograph.

Illustrative  
photographs.

No. 103 shows McGann's Flat on the Upper Cape diggings in Queensland, and illustrates at the same time one of those rare cases in Queensland where deep alluvial mining has been carried on. As has been before remarked, nearly all the alluvial diggings of Queensland are shallow and easily worked out. Here, however, the depth of mining in order to reach the bed rock on which the gold was found, varies from 30 to 120 feet.

No. 104 is taken from near the junction of the Lynd and Copperfield rivers, Northern Queensland. In the foreground is shown the outcrop of a

copper lode which at a depth of 40 feet was known to be 20 feet thick ; but as the ore did not average more than 10 per cent., the cost of cartage to the coast was an effectual bar to further exploration.

No. 105 is a view of the township of Ravenswood shortly after the discovery of the diggings there. The ore from the reefs is of a highly pyritous character, in some cases attaining as much as 30 per cent. of copper pyrites, and occasionally yielding as much as 15 ounces of gold per ton. From the surface to the water level these ores were decomposed and assumed the form of oxides ; there was in consequence no impediment to the satisfactory amalgamation of the gold by mercury, and so long as this surface work was carried on the miners were well content with the results, and the whole of the lodes were in consequence worked down to the water level.

No. 106 well represents the peculiar feature in Queensland gold mining, "ravine working." Here the gold is found among the rolled boulders of the creek bed, and imbedded between the crevices of the rock, sometimes to a depth of 6 or 8 inches. The tub, cradle, and tin dish, the only machinery applied to this form of mining, will be duly noticed in the picture.

No. 107 shows the ordinary method of raising quartz from the mine until steam is introduced to the work. This photograph was taken in the early days of the Gympie diggings. Now, however, all the modern appliances of steam machinery, both for raising and crushing quartz, are in full operation. The quartz raised from some of the mines in these diggings has already been noted as perhaps the richest in Australia.

No. 108 is also a view in the Gympie mining district. The next picture (109) is an illustration of the method of conducting business in some cases on the diggings : a shoemaker wishes to purchase a cradle—(not to rock a baby,) but to separate the virgin gold from the dirt with which it is associated,—and he brings a pair of boots to effect his purchase. Such a primitive mode of conducting business has, however, ceased long ago ; gold in coin and in its native state are the circulating medium on the Queensland gold fields.

No. 110 represents the digger enjoying his *otium cum dig.* on that one day in the seven which even he sets apart for cessation from labour. The strictness in which Sunday is observed is in fact one of the features of life at the Australian diggings.

Nos. 111 and 112 are views of the rough plant erected for smelting on the Peak Downs copper mine. Here copper to the value of more than a million sterling has already been raised, smelted, and shipped to the European markets, and the mine is still in active operation. No ore has yet been raised from below the 40-fathom level.

The wall cases contained samples of auriferous quartz from various diggings and refuse tailings from the stamping mills. The loss of gold from imperfect manipulation in the tailings is more than equal to the yield obtained ; with improved machinery and a more economical system of mining the auriferous quartz veins of Queensland offer endless remunerative employment to the enterprising miner.

Amongst the various mining products of Queensland arranged in the table cases were auriferous ores from various diggings ; lead ores from the Gilbert district, Cloncurry, Western Creek, and Stainton Harcourt in the Burnet district ; copper ore from Cloncurry, Peak Downs, Star River, Princhester, &c. ; antimony ore from St. John's Creek in the Burnet district ; bismuth ore from Cloncurry, silver ore from New Zealand gully in the Rockhampton district ; stream and lode tin from the Stanthorpe, Palmer, Star, and other districts ; and a variety of ores a description of which was attached to the specimens themselves.

The regulations affecting the acquisition and holding of land for the purpose of mining for alluvial gold, and those affecting the holding of auriferous reefs in Queensland, were displayed in frames in this division. They are as follows :—

Regulations for  
acquiring mining  
claims.

**REGULATIONS** affecting the ACQUISITION of LAND for the purpose of MINING for ALLUVIAL GOLD.—The holder of a "Miner's Right" (acquired by an annual payment of 10s.) is entitled to hold an ordinary alluvial claim of 50 by 50 feet, and a Company can hold 50 by 50 feet for every member : each block to be rectangular, and no side being less than 50 feet ; or, in wet

alluvial claims, 50 by 100 for one person, 100 by 100 feet for two, and so in proportion for any greater number of a party; or, in rivers or creeks, 50 lineal feet in the general direction of the stream.

*Conditions.*—To be continuously worked, but transferable.

**REGULATIONS affecting the HOLDING of AURIFEROUS REEFS in QUEENSLAND.**—The discoverer of a gold-bearing reef is awarded as follows:—

With 100 feet	} along line of reef if less than -	{ 400 yards one mile two miles ten miles over ten miles	} distant from any line of reef worked.
„ 150 „			
„ 200 „			
„ 300 „			
„ 500 „			

The holder of a “Miner’s Right” (which is acquired by an annual payment of 10s.) is entitled to 50 feet by 40 deep along the line of reef, or a Company is entitled to 50 feet by 40 deep each man.

*Conditions.*—Claim must have boundaries marked at right angles to base line; registered, and worked by half the number of miners to whom claims are allotted.

Leases of land not exceeding 25 acres may also be obtained for a term of 21 years, after a gold field has been two years proclaimed, at a rental of 1*l.* per acre per annum.

#### DIVISION XI.—AGRICULTURAL.

Division XI.—  
Agricultural.

Photographs 113 to 124 and 124A to 124L represent various phases of agricultural life in Queensland. In Nos. 113, 114, and 115, we have a view of selector’s homesteads in the Mary river district. The clearing has here been effected on the river bank, formerly occupied by dense scrubs. This land, technically known as “scrub,” is of the richest description, and has been found admirably adapted for the growth of any kind of agricultural produce, and notably, where the climate is suitable, for the growth of sugar-cane. At present the banks of navigable rivers have chiefly been chosen for pioneer occupation on account of the facilities of sending the produce to market at a cheap rate.

No. 116 is a view of the Messrs. Raff & Co.’s sugar plantation, Moray-fields, on the Cabulture river, in the Moreton district. The crushing plant is seen in the foreground, with the cane plantation behind.

No. 117 represents a sugar mill in the Mackay district; the type of a large number of mills erected on many thriving plantations in the same district.

No. 118 illustrates the means adopted to convey the sugar from the plantation to the wharf, where water carriage is not available.

No. 119 shows us the hut of an agricultural pioneer, a class of building probably not unknown, and not for the first time seen in the United States. It is a slab hut roofed with shingle; pigs, poultry, and children thrive naturally in all such settlements in Queensland, and in this picture representatives of each were present in force when the photographer happened to pass that way.

No. 120 is a view of a sugar manufactory in the Maryborough district, and is a type of plant sent out from England to the order of settlers in the Mary River district.

In No. 121 are shown the usual adjuncts of a sugar plantation, beds of pine-apples and groves of orange trees; throughout the whole of the coast district of Queensland the pine-apple flourishes most luxuriantly, yielding the finest and most full-flavoured fruit.

No. 122 is a view taken on the plantation of Mr. Davidson, a pioneer planter of the Mackay district. The luxurious growth of the cane is here unmistakably apparent.

No. 123 presents a view of the establishment of a sugar planter, and in No. 124 we have a satisfactory proof of the capacity of the alluvial banks of Eastern Queensland for the production of sugar-cane.

#### DIVISION No. XII.—AGRICULTURAL.

Division XII.—  
Agricultural.

This division is also devoted to agriculture, and is illustrated by photographs from No. 124A to 124L.

No. 129A shows a clearing in the scrub for sugar plantation on the Herbert River in Northern Queensland.

Nos. 124B and 124C are views of the residence of a sugar planter on the Macnade plantation, Herbert River. These are examples of a considerable number of planters' residences situated on the same river; where a large area is taken up for the purpose of forming plantations, but the proprietors are at present engaged more at clearing their land than in building houses.

No. 124D is a view of the sugar mill erected on the same plantation.

No. 124E shows the means adopted by the planters on the Herbert River for forwarding their sugar to market by means of flat-bottomed punts suited to the navigation of the river.

No. 124G is a characteristic view met with on the banks of the Herbert River.

No. 124H, I, J, K, and L, are characteristic views of such areas in Queensland as could be selected at the rate of 15s. per acre in the settled districts of the Colony. These are classed as First Class for agriculture, and the payments are made by equal instalments, extending over 10 years. The richest alluvial scrub soils, and the volcanic districts of Queensland, are the only ones usually classed as agricultural, and as open for selection at the above-named rate.

Underneath the photographic illustrations in Divisions XI. and XII. were the usual table cases containing representative samples of cotton, maize, wheat, barley, coffee, tea, sugar, arrowroot, tobacco, &c.

Also samples of cocoons and raw and manufactured silk; the production of silk is now receiving careful attention in the colony.

Farming statistics.

#### *Farming Statistics.*

The Queensland farmer differs materially from his brother operator in other parts of Australia, in the kind of climate, rainfall, soil, and crops he has to contend with. He has little frost and no snow to fear or provide against. He can, in some favoured localities—such as the Darling Downs—turn out a fair wheat at the rate of from 20 to 30 bushels to the acre, and his bacon, hams, and butter are here almost up to the mark of the New Zealand, Tasmanian, Victorian, or Shoalhaven production in firmness and flavour. Gatton, too, near the approaches of the great Main Range to the lower country of Ipswich has a specialty for potatoes, almost rivalling the far-famed Brown's River product of fair Hobart Town. The farmers in Queensland grow arrowroot and sugar, and they make wine, but not raisins as yet. They raised enough wheat in 1873 to turn out 1,300 tons of flour, besides meal, &c.; and there were, during the same year, 125,968 lbs. of arrowroot made in the colony. Maize is also greatly cultivated, and both it and arrowroot are grown to an extent nearly equal to all the home consumption. Tobacco to the amount of 8,568 lbs. was manufactured in the colony in 1873, as well as 41,979 gallons of wine. The ordinary vegetables of domestic life, such as the carrot, turnip, cauliflower, asparagus, artichoke, &c., can all be well grown in Southern Queensland, and the fruit of the hibiscus, known as rosella, and that of the Cape gooseberry (*Physalis Capensis*) make a jam and jelly more suitable for invalids afflicted in liver or lung than any other in the world. But ordinary farming is an avocation not followed up to the fullest as yet in Queensland, or the imports would never show nearly a thousand tons of hay per annum still brought into the colony, as is the case. The mountain slopes of the southern parts will support a fair proportion of farmers; but fewer of them (in the general sense of the term) will take root in the north. Honey is plentiful and delicious, as the native flowers are abundant and full of refreshing fragrance. In short, when the science of irrigation has been a little more mastered and matured than it is at present, and when a little pastoral is blended with the agricultural industry on each farm homestead in Queensland, then there will be few happier or more independent men on the face of the earth than the yeomen of the southern parts of this colony. Wool, cotton, silk, maize, oil, wine, honey, raisins, figs, olives, tea, coffee, oranges, lemons, citrons, pine-apple, banana, cheese, butter, ham, and bacon; and still more sources of profit are open to him, and, in a word, all the varied products of Spain, Portugal, France, and Italy are at the command of man's industry in this new territory of Queensland. Operations are, however, chiefly confined

Necessity for irrigation.

to lands within 100 miles of the sea, for the rainfall steadily diminishes with every degree we recede from the coast.

Decrease of rainfall towards the interior.

### *Sugar Growing in Queensland.*

Sugar growing.

This universally important article of commerce is destined to figure heavily and increasingly among the products of North-eastern Australia, or Queensland. In the year 1866 there was no sugar grown here at all. In 1867 a modest 168 tons were made, the returns swelling to 619 tons in 1868, and increasing to 1,490 tons in 1869. In 1870 the product had grown to 2,854 tons, and in 1871 to 3,762 tons; 1872 again saw this nearly doubled, in the shape of 6,266 tons; and in 1873, the latest year up to which full official returns have been made, the quantity was 7,987 tons. The yield for 1874 is no less than 14,000 tons! And as the quantity has increased so has also the quality of the article; and the refined whites from Yengarie, and the splendid "raws" from Eaton Vale, are able to recall the palmiest days of glorious old Demerara, with its superb saccharine crystals, drawn from those measureless depths of rich vegetable soil in the great South American Savannah. The quantity of molasses, too, it is needless to say, has kept pace with the yield of sugar, and has gradually crept up from 13,100 gallons returned in 1867, to 442,253 gallons in 1873. The sugar mills were six in number in 1868, and they had become 66 in number by 1873. There were 1,238 acres of cane crushed during the year 1869, and by 1873 there were no less than 5,380 acres of it put under the rollers. The rum of 1867 is now prized above any Jamaica for its rich mellowness, for in those inexperienced days they did not, in Queensland, stint the sugar in making it, as is now done in the more sophisticated West Indies. In that year they distilled only 12,045 gallons in Queensland, but in 1873 they made 161,413 gallons. Sugar-growing is carried on in all the Logan country which lies between the Brisbane River and the stupendous M'Pherson's range, the southern boundary of the colony. This Logan district includes the Albert, the Pimpama, the Coomera, the Nerang, and other divisions of that agricultural community which is found on the south side of the metropolis of the colony. Another large centre of sugar-growth is found in the Maryborough district, where Messrs. Tooth and Cran's great refinery at Yengarie supplies a want in the way of costly machinery and finished appliances which other parts of Queensland do not enjoy. But the sugar country, *par excellence*, of North Australia is found on the Pioneer River, of which Mackay is the shipping port. The climate is here no longer a matter of doubt and question, as it is at Maryborough and the Logan, in respect of its suitability for sugar growth. The absence of frost and the presence of rich depths of treeless soil put this at rest; and it is here that some of the heaviest returns per acre have been realised. The country at the back of Cardwell, still further north (and in the latitude of Jamaica), turns out a splendid article in sugar. One pleasing feature in the growth of it is found in the lucrative return made to the small working farmer, who, even more than the capitalist, has found fair profit yielded from his sugar-cane patch, which has put his maize and potatoes quite in the shade in his yearly balance-sheet.

The yield of sugar per acre of cane throughout the colony, although in some favoured cases it has reached as high as four tons to the acre, has averaged as follows:—In 1869 the return was  $1\frac{1}{2}$  ton to the acre; in 1870 it was  $1\frac{1}{2}$  ton to the acre; in 1871 it was  $1\frac{1}{2}$  ton to the acre; in 1872 it was the same; and in 1873 it considerably exceeded a ton and a half to the acre through the colony. We are just beginning to have sugar for export, and shall soon be able to pay Adelaide for her flour in something more satisfactory to ourselves than bank drafts; and as with South Australia so with other places in which the balance of trade is at present decidedly against us. As before stated, in farming statistics, the operations are carried on near the coast, as the rainfall decreases as we go westward. Thus at Brisbane, 10 miles from the sea, it is 52 inches per annum; at Warwick, 90 miles from the sea, it is 32 inches per annum; and at Springsure, 160 miles from the sea, only 25 inches.

Yield of saccharine matter.

It is noticeable in connexion with this industry, and indeed with farming generally, that those engaged in it take a living interest in their business. In no country that we know of is information furnished more freely than by the farming classes of Queensland.

Division XIII.—  
Pastoral.

DIVISION XIII.—PASTORAL.

Photographs 125 to 136, and from 136A to 136K, illustrate various phases of pastoral life in Queensland.

Nos. 125 and 128.—Here we have a typical view of an Australian squatter's homestead. This is the kind of home formed by men who, when once they have enjoyed the freedom and health-giving qualities of the occupation to which their lives are devoted, rarely return to the restraints of civilization with pleasure, or without a continual longing to return to their Australian homes.

Nos. 126 and 127 show one of the principal means by which the wool is brought down from the stations to the coast for shipment. The bullock drivers are camped for their mid-day meal, and the beasts are turned out to rest for a short time from that pulling and hauling which is the normal condition of their existence. Hundreds of men find profitable occupations as teamsters on the road to supply the miners and settlers with stores, returning to the coast with collected produce.

No. 129 is a picture of a pioneer squatter's homestead. This, as may be supposed, is generally rather rough, and built of the inevitable slabs and bark which the timber of the country everywhere affords in abundance, except on the great prairies of the west.

No. 130 is a wool shed on the Darling Downs, and under cover of such a building something more than a million sheep are annually shorn on these downs alone.

No. 131 is a view of Westbrook Station, on the Darling Downs, one of the earliest formed in that district.

Nos. 132 and 133 are also views of station homesteads of the rougher description, such as are erected by the pioneer squatter.

No. 134. Sweep washing.

No. 135. Cattle branding.

Division XIV.—  
Pastoral.

DIVISION XIV.—PASTORAL.

This division was also devoted to the illustration of the pastoral districts of the colony, and is represented by photographs running from No. 136A to 136M. Nos. 136A and 136B illustrate the usual mode adopted by holders of stations of delivering their wool at the port, and carting the stores to their stations. Although horse teams have latterly been very much in use, bullock teams are still found to be the most generally suitable for rough bush roads.

No. 136C depicts the tailing of cattle after a muster has been made on the stations by stock men.

No. 136D is a characteristic view of "coast country" in the neighbourhood of Maryborough.

No. 136E is a view of a portion of the "Peak Downs," with the Peak Range in the distance. The discovery of this fine volcanic district was first made by the explorer Leichhardt, and no terms of admiration seemed to be too great, in expressing his ideas of it, as a magnificent pastoral district if sufficient water supply could be obtained.

Wells and dams have supplied this natural want, and now nearly a million sheep are depastured on the Peak Downs proper.

Nos. 136F, G, H, I, are devoted to the illustration of the various descriptions of country which can be selected either as first-class pastoral at 10s. per acre, or second-class pastoral at 5s. per acre over certain districts of the colony, payment by equal instalments spread over 10 years.

In the table cases under Divisions 13 and 14 samples of some of the principal brands of wool produced in the colony are exhibited.

Pastoral statistics.

*Pastoral Statistics.*

The great pastoral or "squatting" interest has the merit of having steered Queensland in safety through her early primeval struggles towards the goal of her present prosperous existence, and it is still, though now becoming ably rivalled by the mineral interest, and (now that the article of sugar has entered the field) by the agricultural and manufacturing ones also, the leading industry of the colony. The introduction of the paddock system, has, how-

ever, in many places reduced the number of hands, and the field for the employment of labour, but as no machinery for shearing sheep, driving bullocks, &c. has yet been patented, the squatting interest still continues to circulate much money in the colony. The number of horned cattle in Queensland at the close of 1872 was 1,200,992, and at the end of 1873 the muster had increased to 1,343,093, showing an augmentation of 142,101 for the year, or nearly 12 per cent.; and if we take the same rate of increment to obtain for the year 1874, it would give us on the 1st January 1875 something over a million and a half of horned cattle in the colony at that date. Horned cattle.

With respect to the sheep, the close of 1872 was 6,687,907 of them in Queensland, and by the end of 1873 that number had increased to 7,268,946, showing a gain of nearly 9 per cent. for the year, which rate, if taken to represent the accession of numbers for the year 1874, would bring us up to nearly 8,000,000 of sheep in the colony of Queensland on the 1st January 1875. Sheep. The stock in our territory is on the whole very healthy and free from disease. Great mistakes were made at one time in stocking the far north country with sheep. They did not thrive there, and had all to be replaced with cattle, which do well up to the very Cape York itself. The number of horses in the colony at the close of 1873 was 99,243, an increase of about 7 per cent. on the preceding year; and the pigs increased from 35,732 to 42,884 in 1873. Horses. With respect to the income derivable from these vast pastoral resources, the exports of live stock borderwise for 1873 were—

265 horses, valued at	-	£2,385	} Exported borderwise.
31,113 cattle	-	179,090	
510,284 sheep	-	205,238	
Making a total value of £386,713			
Add to this—			
Hides	-	£72,941	} Exported seaward.
Tallow	-	50,809	
Wool	-	1,374,526	
Preserved meats	-	62,085	

And we have a total of £1,947,044 in exports derived from pastoral sources; and even this does not include the meat, hides, leather, &c. used for home consumption; these and sugar being some of the few items for which Queensland is not dependent on extraneous aid, as she is for clothing, breadstuffs, &c. On the vast array of storekeepers, agents, drovers, and banks, who thrive and fatten on all this teeming produce, we need not here enlarge. Suffice it that squatting still continues to be the leading industry of the colony, though of late years it naturally enough has not continued to grow with the same rapid strides which have marked the other and younger branches of our productive wealth.

The wool, in lbs., exported in 1873, was 19,763,113 lbs. The wool exported in 1874 was 20,859,346 lbs., of the value of 1,420,881*l.* The gross exports for 1874 were of the value of 3,750,048*l.*, which, reckoning population at 160,000, is 23*l.* 10*s.* per head per annum, unrivalled in the world. The above are official returns. Wool.

#### DIVISION XV.

Was devoted to the illustration of Queensland towns and villages. The numbers of the photographs run from 137 to 144, and include views of Somerset, Rockhampton, Townsville, Cardwell, Gladstone, and Maryborough. Division XV.—  
Illustrations of  
towns.

#### DIVISION XVI.

Was also devoted to the illustration of Queensland Towns. The numbers of the photographs run from 145 to 154, and include views of Maryborough, Brisbane, Ipswich, Toowoomba. Division XVI.—  
Illustrations of  
towns.

A short description of the rise and progress of these towns is taken from the "Queenslander."

## Brisbane.

*Rise and Progress of Brisbane.*

Brisbane, the metropolis of Queensland, occupies a fine hilly, bold site on the banks of the river of same name, which is here about 1,000 feet wide. It is neither the prettiest nor yet the ugliest capital in Australia; it lacks the noble harbour of Sydney, and the snow-capped background of Hobart Town; but still it has its distinguishing advantage, for none of the sister cities command anything approaching such a sweep of really grand view in every direction as Brisbane does, and extending 160 miles from north to south, and 100 from east to west—an area nearly equal to all Tasmania. On the south are visible Mount Lindsay, nearly 100 miles ride from Brisbane; also the great rainy M'Pherson's Range, a wall at right angles to the coast, and nearly 6,000 feet high in places; while, on the north, the eye commands the Kilcoy and other ranges which shed the distant head waters of the Mary and Burnett rivers on their northern slopes. To the west, the dim blue peaks of the Main Range, serrated by the gaps of Koreelah and other passes, loom 70 miles away, and mark the site of Darling Downs; while, to the east, the sea view is shut in by the cypress pine hills and sandy cliffs of Moreton and Stradbroke islands, thirty miles away. Brisbane is built on a cape of land formed by a bend of the river, the said cape pointing to the south-east. On the north-east and south-west of Brisbane is the river, 1,000 feet wide; on the south-east of the city lie the Botanical Gardens, and on the north-west rise the Windmill Hill and Wickham Terrace Reserves, so there are fresh air and "lungs" in plenty all round the pretty metropolis of Queensland. And speaking of fresh air we are reminded of fresh water, with which no city in the world is better supplied in proportion to its population than Brisbane is. About seven miles back from town, and at an elevation of 240 feet above the tidal river level, the waters of Enoggera Creek are dammed back to form a lake of about 200 acres in extent, and 40 feet in depth, creating a water supply which, for volume and pressure, surpasses that of Sydney, with six times the population of Brisbane. The reservoir is thus constantly fed by the waters of a pure mountain stream which rises in broken granitic country that surpasses in unfrequented wildness and difficulty of access even the loftier ranges of the tin country, and so fortunately guarantees a continued freedom from any impurity. Beautiful villas—commanding extensive and picturesque views of mountain, sea, river, garden, farm, and forest, in every shade of pleasing tint and sharp outline, under the clear sky of Australia—are found on all the suburban roads. The present population is about 25,000.

## Ipswich.

*Rise and Progress of Ipswich.*

This town, formerly called "Limestone," from its geological formation, was established as a branch penal station in connexion with Brisbane, at the same time as the latter was, and being at the head of river navigation, and the spot where the steamers and bullock drays met and exchanged their respective loading, such as wool for station supplies, in the old days before railways were thought of, Ipswich soon became a thriving place after the settlement of Darling Downs, and contained at one time no less than 30 "hotels;" and the boiling down of stock added still more to the bustle of its daily life. So great indeed were its vitality and growth, and the energy of its inhabitants, removed as they were from the enervating influence of the sea air, that at the time of separation, its population and electoral roll being about equal to those of Brisbane, it disputed the right of the latter place to be declared the seat of Government of the new colony. Since that time, however, Ipswich has, owing to the advent of railways, and the cessation of boiling down of stock, and other causes, not progressed so rapidly as in the first few years of its existence. It is a neat, clean town, with some four or five thousand inhabitants, a creditable volunteer force, numerous branch banks, and Government offices, and depends at present for its support on the magnificent agricultural district by which it is surrounded. The abundance of coal in its immediate vicinity gives promise of its being the seat of manufacturing industry in the future, and there seems little doubt about its becoming ultimately a large and populous town. Its present population is about 6,000.

*Rise and Progress of Toowoomba.*

Toowoomba.

This township was once the site of a grassy camping ground for the Darling Downs bullock teams in olden times; and, it being a well-watered open dell near the edge of the Main Range, and some 2,000 feet above the sea level, teams used to rest here both before making the descent and after accomplishing the ascent of the Corderilla, especially as the grass was splendid, the soil a dark red, and the open timber of gigantic stringy bark and green wattle, rich in gum and bloom, bespoke a wholesome, pleasant country to dwell in. Two large swampy "sponges," separated from each other by a ridge, gradually converge, and unite to form the head of Gowrie Creek. This place, known once as "Drayton Swamp,"—in honour of the ancient healthy and now almost obsolete township of Drayton, of 1843–57—is now the leading township of Darling Downs. It had in 1854 but one house on it; in 1857 it was still inferior to Drayton; but by 1859 it had asserted itself, and the parent township had to take a secondary position. Since that time Toowoomba, nourished by the trade arising from pastoral and agricultural sources alike, and with some hope of minerals too looming in the future, has continued to go ahead, its only check having been during 1866 and the following years. Its public buildings, stores, streets, shops, churches, chapels, and volunteer corps (captained by Sydney Smith, a Crimean officer), all denote substantial prosperity and genuine public spirit, and a healthier, pleasanter, "pluckier" township does not exist in Queensland. It enjoys railway communication with Brisbane, Ipswich, Warwick, and Dalby, the two latter lines converging at Toowoomba. A powerful well-organised agricultural and pastoral society holds its useful periodical show meetings here, and the mountain air, keen breeze, rich pasturage, and the grand wine and wheat country around this favoured spot of earth, all help to impart a vigour to its denizens and doings which is thoroughly English in character, and the cheeks of the people are quite as rosy as their apples, which is, indeed, saying a great deal. The mean temperature is 62°, which is considered by physicians to be the happy medium furthest removed from undue heat and cold alike, and the one most suited to the human constitution. Its present population is about 4,000.

*Rise and Progress of Warwick.*

Warwick.

Warwick is situated on the southern part of Darling Downs, on the banks of the Condamine River, a gravelly dry site, and a very English-looking place altogether. There are fine farms and vineyards all round it, and the splendid pastoral properties which are close at hand, as well as the tin mines only fifty miles away from its railway station, give Warwick a comfortable status amongst the Queensland towns. Its present population is about 3,000.

*Maryborough.*

Maryborough.

Is a municipal township on the River Mary, 60 miles from its mouth, about 180 miles north of Brisbane.

It is the port of shipment for the greater portion of the Wide Bay and Burnett district, and is in the centre of a large agricultural population settled on the banks of the Mary River, both above and below the town.

It will be seen from the panoramic view of the town exhibited in Division XV. that there is still plenty of room for the erection of buildings even in some of the main streets.

That these gaps will soon be filled up, however, there can be little doubt, since it is one of the soundest business towns in the colony, and has a large and increasing trade, from the mining, agricultural, and pastoral district of which it is the port.

The present population of the municipality is about 5,000, of the suburbs and the agricultural settlements in the neighbourhood about 4,000 more.

*Rise and Progress of Rockhampton.*

Rockhampton.

This town did not exist in 1857; when the announcement at the Surveyor-General's office in Sydney (by a Brisbane gentleman visiting there,) of the fact that there existed in Keppell Bay a navigable river called the Fitzroy, as wide and as deep as the Thames, caused a surveyor to be sent up and a township to

be laid out at once, about 45 miles from the river mouth, and just below a reef of rocks which barred all further navigation upward for large vessels. The streets were judiciously planned, like those of Melbourne, two chains wide, and Rockhampton is consequently a well-built and fine-looking town, and being the focus and shipping port of a vast rich mineral and pastoral belt of country on the Dawson, Mackenzie, Isaac, Comet, and other rivers, as well as of the Peak Downs country, it possesses a great trade, and will in time, when railways pierce the interior, become a place of very considerable importance. The Athelstan Range, at the south of the town, rises to the height of about 150 feet, and on it are situated the suburban residences of the leading townspeople. Water is supplied from the Yeppen Yeppen and Crescent Lagoons, and there is steam communication with Yaamba, some distance further up the river.

Mount Berserker affords a rich field of research to the botanist and geologist. In fact, Rockhampton is the centre of a rich gold and copper district, and minerals are found in nearly every direction you can travel from it. The present population is about 5,500.

#### Gympie.

##### *Rise and Progress of Gympie.*

A wild and unfrequented spot on the banks of the Upper Mary River, and one of little use for pastoral purposes, and so, consequently, seldom traversed, was suddenly, towards the close of the year 1867, awakened to brisk life by the discovery, at the hands of a man named Nash, of a rich deposit of alluvial gold containing some 17,000*l.* worth of dust. He took it up very quietly, and sold some of it in Brisbane as "Cape River" gold; but the secret oozed out at last, and Gympie Creek was worked for alluvial digging. Strange and wonderful adventures befel the few citizens of Brisbane who essayed the perils by flood and field of an overland trip to that unexplored country (supposed in olden days to consist of mahogany swamps and sour grass ranges) which lay between the metropolis and the golden creek (for the Moololah, Maroochydore, and other rivers with rich soil banks were unknown to fame then). By and by, however, the alluvial was found to be a shallow myth, and rich reefs of quartz and calcspar traversing a greenstone or diorite rock were found to contain fabulous wealth in gold, and the New Zealand, Lady Mary, Smithfield, Monkland, Caledonia, and other famous reefs began to send forth their splendid specimens to astonish the metropolitans, and the machine crushings soon placed Gympie at the head of the world in the return of gold per ton of quartz: the *magnificent and unrivalled average of nearly 2½ ounces to the ton having been maintained on this field up to the end of 1870*. The road to Brisbane was put in order, and Cobb and Co. began to appear on the scene. A well-conducted newspaper soon graced the new township, and Gympie from 1868 to the present time has continued to be one of the "great facts" of Queensland. Like other large quartz-crushing centres of industry, it has been afflicted with one drawback, and that is in the manner in which all the luck seems to flow into few hands, who became inordinately rich, and all the rest of the people correspondingly poor. This is the case at Gympie, where many a man, who never would have owned 100*l.* anywhere else in the world by his own exertions or brains, has found the gold grow, as it were, wherever he went to dig. Some of the early crushings at Gympie were wonderful; there was really more gold than quartz in some of the veins, even in mere bulk, and the machine had to be stopped sometimes, as the soft, malleable, ductile metal remained immovable and insensible under the stampers to the action of the water, clogging like so much "toffy" or cobbler's wax, and so had to be cleared away before the steel hammers could be effectually brought to bear on the ordinary quartz. Gympie continues to flourish, and presents as fine an opening for capital as any gold field in the world. The present population of Gympie and its suburbs is about 6,000.

#### Townsville.

##### *Rise and Progress of Townsville.*

That "trade makes the port," and not the port trade, cannot be better exemplified than in the case of Townsville.

This port is situated in latitude 19° 10' south, and 146° 58' E. longitude, and is only about 80 miles from the town of Bowen, which enjoys one of the finest harbours in Australia, whilst every facility can be given to the shipment of produce; yet Bowen has suffered a continued decadence since the formation of

Townsville, the progress of the latter (with not a tithe of its facilities for trade as far as the port is concerned) having been continuous, as the following comparison of exports and imports, between 1865 and 1875, will show :—

Port of Cleveland Bay. 1865, imports 570*l.*, exports 8,145*l.*, customs receipts 112*l.* 15*s.* 4*d.*; half-year ending 30th June 1875, imports 67,116*l.*, exports 168,885*l.*, customs receipts 17,411*l.* 5*s.* 8*d.*

The agricultural resources of Townsville, and the immediate district around it, are not great; but extensive and permanent gold fields, and a vast area of pastoral country, for which it forms the natural port, have combined to raise it into importance.

These gold fields are Star River, Ravenswood, Charters Towers, Cloncurry, Gilbert, and Etheridge.

The copper mines principally awaiting the pushing out of a railway from Townsville westward before development, are situated on Star River and Copperfield River.

The amount of gold exported from the port of Townsville is as follows, and there can be little doubt that the mineral wealth of the district, for which Townsville is the port, is as yet only developed to a very small extent, and will be greatly increased in the future. Its population is about 1,800.

Total of gold exported since its discovery in 1866 to June 30th, 1875, 569,818 ounces; value 1,990,610*l.*

Although situated well within the tropics, the heat to be naturally expected at Townsville is tempered by the influence of the south-east trade winds, and with properly constructed residences, and attention to keeping them cool, there seems no reason why the inhabitants should not enjoy as good health as those who reside in Brisbane or Maryborough.

#### *Cardwell, its Rise and Progress.*

Cardwell.

In Rockingham Bay, some 90 miles to the north of Townsville, is the pretty little town of Cardwell. The bay which it faces is one of the most beautiful, as well as the finest harbour in Northern Queensland. Its picturesque situation at the foot of the loftiest mountains of the coast range, its elegant public buildings, and tropical scenery, render it a study for the painter. The difficulty of overcoming the coast range has hitherto presented an obstacle, not altogether insuperable, to its rapid progress; but this drawback, it is confidently expected, will shortly be overcome, as an accessible road has lately been discovered over the range. Its population, including that of the neighbourhood, is estimated at about 300. The gold escort from the Etheridge has its headquarters here. The surrounding districts are pastoral principally, and large numbers of sheep and cattle are reared on its rich pastoral lands. Tropical fruits grow here in wild luxuriance. It is from this port that the squatters and Herbert River planters draw a large proportion of their supplies. A jetty, 2,000 feet long, extends into the bay. Cardwell contains a court house, two hotels, two stores, a national school, a branch of the Bank of New South Wales, a telegraph office, a post office, and a dugong oil factory.

Should the Palmer River diggings approach Cardwell as closely as they at present promise to do, a great future is yet in store for this lovely town. Springs of fresh water which are constantly running on the beach, even below high-water mark, are a peculiarity of Cardwell. A pilot, pilot cutter, and crew are stationed here. The steamers of the Eastern and Australian Company call here.

#### *Cooktown.*

Cooktown.

A newly proclaimed mining township situated on the northern bank of the Endeavour River, about 1,050 miles N.W. of Brisbane.

Though the town has been born in a day, it will most likely take its place as one of the most important centres of the colony, should the yield of gold continue from the Palmer River district for which it forms the port.

Already a large population has settled at Cooktown, and as the available sites for building are limited, it is likely that such sites will become very valuable.

## Somerset.

*Somerset*

Is a small township situated at Cape York, 1,550 miles N.W. of Brisbane.

It is a harbour of refuge and a place of call for the vessels engaged in the Bêche le mer and pearl shell fishery of Torres Straits, which is now employing a large fleet of ships.

At the present time there are fifty large boats engaged in the fishery.

As an instance of the profitable nature of this trade, it may be mentioned that a vessel made in one season no less a sum than 6,000*l*.

Divisions XVII.  
and XVIII.

## DIVISIONS XVII. AND XVIII.

Were devoted to miscellaneous subjects, photographs of public buildings, views on the railway lines of the colony, &c., and in the table cases were grouped miscellaneous products and manufactures.

A few statistics of a miscellaneous character selected from the "Queenslander," will be here introduced.

## Climate.

*Climate of Queensland.*

On this subject we must needs have a "chequered tale to tell," in traversing 19 degrees of latitude. One thing, however, is certain and universal, and that is, that there is a most decided and palpable yearly winter met with in every part of the great colony. First, we have the winter of Scotland, which obtains amongst the huge Aberdeen cairngorms, blue topazes, and smoky quartz crystals which head the gullies in the tin-bearing mountains of Stanthorpe. Then we have the winter of Southern Queensland, which ranges intermediate in mean temperature between those of Madeira and Bermuda, and is most grateful to all lungs wearied of battle with the gales of New Zealand and Bass' Straits; calm, clear, equable, pure. No weather ever seen in England can recall it. A linen suit does not feel too cold to wear, nor a monkey-jacket too warm; the one feels just like the other to a new arrival in this elysium of an atmosphere. Back, however, from the sea and its equalising influences, the wintry cold, especially on the table lands of Darling Downs and the Burnett, ranges from 15° to 35° on the nights of June, July, and August, and no matter how far north or west you may go, the winter cold, either from its own actual thermometrical register or from its contrast with summer heats, is very marked and much felt, and enjoyed or dreaded, as the case may be, according to the constitution and habits of the individual who experiences it. Thus in June, at Brisbane (the metropolis of the colony), the midday is that of a London June, while the midnight is that of a London February, owing to clear skies and rapid radiation of heat from the earth; hence arises much rheumatism to those who neglect to change their attire at nightfall. Strange to say, however, some people lose all their previous tendency to rheumatism by a visit to the climate of Brisbane, whose mean temperature is that of Madeira, 68°. Rockhampton is the same as that of Algiers, and Stanthorpe the same as London is, the resemblance being carried out month by month, except that spring comes on six weeks or so earlier in Australia. In Northern Queensland, which is within the monsoon's influence, there are, of course, the wet and dry seasons yearly, almost without interruption; while in the southern parts of the colony the periods of flood and unusual wet are farther apart. The prevailing winds in Southern Queensland are, north-east, from the sea, in summer, and south-west, over the land, in winter; the former being full of ozone and life, the latter, though bracing, is arid and irritating to delicate bronchials, unless in those cases where dryness is the object sought, and then Queensland is the very place of all others. Further north, the south-east trade wind acts as the ordinary sea breeze, and finds its southern limit at the tropic of Capricorn, as a rule; below which the sea breezes blow from the north-east quarter. The great feature, after all, of tropical Queensland and its climate is that it is the only country in the world, lying in the torrid zone, which is destitute of snowy ranges to feed rivers and make an artificial sanatorium (if we may so call it). South America, Africa, Asia, and even the Islands of Polynesia and the Malayan Archipelago, can show mountains carrying perpetual snow, affording in all cases a change of climate, and in many cases a means of inland navigation, which Queensland is altogether destitute of.

The only considerable mountains, apart from the Cordillera, are Mount Lindsay, on the south boundary (this is a wall-sided peak of some 5,700 feet, now inaccessible ever since a bush fire destroyed the vine ropes by which it used to be scaled); Mount Barney, a noble, graceful double peak, of 5,000 feet, near the Richmond River; and the famous Bellender Ker Mountain, which lies in the latitude of Tahiti, and looks out on the coral-broken waves of the Great Barrier reef from a height of 5,300 feet, and is clothed with thickets of wild bamboo, which hide many an ambushed precipice, within arm's length almost of the unsuspected climber, on its steep but richly covered sides. The Main Range (as the Cordillera is called) averages 4,500 feet in its peaks and summits, and 2,000 feet in its gaps and passes. Snow is unknown in Queensland, except at the Stanthorpe Highlands, and very rarely falls even there. The mountains of Queensland, therefore, except in their influence on the rainfall, are of little importance to her.

Eastern Queensland is an excellently watered country, almost every valley containing its deep pools of this vital necessary, and all beautified by the superb pale blue water-lilies and immense floating leaves of the *Nymphæa gigantea*, the loveliest water plant in the world.

#### *Population and Vital Statistics.*

Population and  
vital statistics.

It is generally (but erroneously) supposed by many who reside out of Queensland, that its death-rate per thousand must be high every year as compared with those of other communities, and considering the risks to human life in a newly-settled country, where the natives on the frontiers are savage, where the rivers are mostly unbridged, and all the hazards inseparable from a bush life must be encountered in their full force, and this, too, in addition to the extreme heat of the climate—when we consider all these, the opinion formed by outsiders of Queensland in this respect, erroneous as it may be, is nothing more than natural after all; yet, on referring to the Registrar-General's official report, laid before Parliament, of deaths for the seven years extending from 1867 to 1873 inclusive (returns for 1874 are not yet made up), we find the average annual deaths per thousand to be 16·39, a result which will compare favourably with that of any country in the world, the more especially so when we take into consideration the latitude of Queensland, the number of new arrivals and consumptive persons who land in bad health, and the numerous resident South Sea Islanders, who generally refuse physic, and die, when ill. In short, when we have regard to the varied dangers to which people in a new country are exposed, the healthiness of the colony is little less than wonderful, and would be quite incredible if the evidence of it were not derived from official and reliable sources.

The deaths for the seven years named were respectively as follows:—

1867	-	-	-	17·80	per thousand people.
1868	-	-	-	17·36	"
1869	-	-	-	19·21	"
1870	-	-	-	14·59	"
1871	-	-	-	14·83	"
1872	-	-	-	14·97	"
1873	-	-	-	16·00	"

7)114·76

Average - - 16·39 per thousand people.

The veritable true winter which prevails as far up as the latitudes 12° and 15° south, where the thermometer at sunrise in June, July, and August, even near the sea and at little above its level, goes down to 45°, is sufficient to account (at all events in part) for this exceptional salubrity, for considering the latitude, no such low temperatures are ever being met with so near the equator in any other part of the world, either north or south of the line, or in any portion, whether insular or continental.

Diseases yield readily to treatment, too, for of 2,658 cases treated in the various hospitals of Queensland, during the year 1873, only 208 deaths were recorded, thus showing 93 per cent. of cures, and at the various gaols, in 756 cases of sickness only five resulted in death, showing a percentage of 99·3

of recoveries. These returns are from the Registrar-General's report laid before Parliament, and prove conclusively either that the climate must be healthy, or else the doctors *very* skilful (one or the other, or possibly both) beyond a doubt.

Taking the population of Queensland, at the close of 1873, at 146,690 souls, and allowing the past average yearly increment by births and immigration, it would bring the population, on July 1st 1875, to as nearly as possible 168,700 people, exclusive of Chinese on the Palmer river; the average increase to the population, from all causes, during the last 10 years having been steadily kept up to 8 per cent. per annum. There are fully 15,000 white men, miners, at the gold fields, and about 6,000 Chinese. There are also some 2,000 Polynesians resident in Queensland, as more than half of those who arrive remain permanently in the colony. Taking the year 1873 for an example, we find 5,097 arrivals from Great Britain, against 78 departures; 2,502 arrivals from Germany, and no departures; 6,291 arrivals from other colonies, as against 5,090 departures; and 1,023 arrivals from the South Sea Islands, against only 288 departures. The births in Queensland for 1873, in a population of 146,690, were 5,720, or nearly 40 per thousand, against 2,250 (or 16 per thousand) of deaths.

The following table shows the official return of population in Queensland from 1860 to 1873 (inclusive) at the close of each year:—

1860	-	-	28,056	1867	-	-	99,849
1861	-	-	34,367	1868	-	-	107,427
1862	-	-	45,077	1869	-	-	109,897
1863	-	-	61,640	1870	-	-	115,567
1864	-	-	74,036	1871	-	-	125,146
1865	-	-	87,804	1872	-	-	133,353
1866	-	-	96,201	1873	-	-	146,690

To conclude this notice we may briefly observe that the average yearly births for 14 years are 43·5 per thousand of the population; the average yearly marriages are 10·6 per thousand of the population; or 21·2 people per thousand get married yearly; and the average yearly deaths per thousand for seven years are 16·39. These results we can fearlessly place by the side of those of most other places and colonies in the world, with every confidence that we shall not suffer by the comparison, taking all collateral matters into due consideration.

#### Revenue and expenditure.

#### Revenue and Expenditure.

As the population of the great colony of Queensland was once very small, so were its revenues and expenses then very modest. In 1846, 13 years before separation, it contained only 2,257 people, chiefly convicts, in all its length and breadth; in 1851 but 8,575 people were counted. Since 1856, its separate existence commenced, and its census will be found elsewhere. It is of the revenue and expenditure we would now speak, and (omitting loans and their disbursement) it stood as follows from 1859 to 1870, and inclusive of land-orders:—

	Revenue.			Expenditure.		
	£	s.	d.	£	s.	d.
1859 (three weeks)	-	-	6,475 17 8	-	-	8,689 10 7
1860	-	-	178,589 8 5	-	-	180,103 9 0
1861	-	-	238,238 9 1	-	-	255,180 4 7
1862	-	-	295,286 8 1	-	-	317,026 10 3
1863	-	-	295,215 5 7	-	-	355,791 14 1
1864	-	-	369,425 6 3	-	-	439,034 18 6
1865	-	-	631,431 17 11	-	-	617,996 8 1
1866	-	-	592,968 10 10	-	-	594,130 0 1
1867	-	-	669,041 8 3	-	-	719,976 11 3
1868	-	-	780,117 6 4	-	-	797,470 0 7
1869	-	-	772,858 8 9	-	-	770,796 13 8
1870	-	-	787,100 2 6	-	-	768,948 9 10

The gross revenue for 1873 was 1,124,107*l.* 12*s.* 3*d.*, and the expenditure for the same year, 956,707*l.* 2*s.* 10*d.*, showing a very satisfactory state of progress

as compared with its population, products, &c., as well as in the habit, too long neglected, of keeping expenditure within the bounds of revenue. The three great items of revenue in Queensland are customs, land revenue, and railway receipts; the first item furnished 480,913*l.* 0*s.* 4*d.* in 1873; the second one yielded 340,083*l.* 2*s.* 6*d.*; and the third amounted to 107,270*l.* 3*s.* 10*d.* The excise and license sources of income are on the increase, so is the postage one.

In the expenditure department, the Colonial Secretary heads the list with an outlay of 228,924*l.* 7*s.* 7*d.*; the Secretary of Works coming next, with 161,203*l.* 8*s.* 7*d.*; the Postmaster-General and Colonial Treasurer following in order, with 83,109*l.* 12*s.* 8*d.* and 74,560*l.* 15*s.* 7*d.* respectively. From the returns made it will be seen that as the receipts from postage only come to 25,413*l.* 17*s.* 5*d.*, and those from the Electric Telegraph Department, 22,131*l.* 14*s.* 8*d.*, the Postal Service still costs the colony nearly 40,000*l.* per annum, which is after all very moderate, considering its vast area, and the immense convenience afforded to business operations in all departments of mercantile, mining, shipping, and pastoral enterprise.

#### Imports and Exports.

Trade.

That Queensland has little need to be ashamed of her position with respect to her contributions to the general stock of the world's industrial products, is shown by her splendid list of exports, which now compares nobly with her imports. In 1863, New South Wales exported 15*l.* 17*s.* per head of population; Victoria, 17*l.* 12*s.* 6*d.* per head; South Australia, 15*l.* per head; and Queensland, 17*l.* 9*s.* 2*d.* per head. In 11 years from this time, Queensland (which has been gradually drawing to the front, and has held the leading place for three or four years past) became able to export nearly 24*l.* per head per annum.

In the four years, 1867-1870 inclusive, Queensland stood as follows with respect to imports and exports.

	Imports.	Exports.
	<u>£</u>	<u>£</u>
1867 - - -	1,747,735	1,989,600
1868 - - -	1,899,119	2,107,437
1869 - - -	1,804,578	2,166,806
1870 - - -	1,577,339	2,533,732

Thus swelling the balance of trade in her own favour in four years from a little over 200,000*l.* to nearly a million, and gaining the foremost place in exporting power per head of population over all the other colonies in Australia, and (we believe) over all the other countries in the world.

In 1873 the gross imports were 2,885,499*l.*, and the gross exports amounted to 3,542,513*l.*; and when, in 1874, we come to add about half-a-million extra from the Palmer Gold Field to the ordinary yearly percentage of increase in exports, the position of our colony in this branch of her statistical annals is still more favourably illustrated.

Commercial panics and fluctuations of trade must all fall lightly upon a community with such a *vital vigorous producing power*. Their terrors are reserved for those countries where there is more paper money than production floating about, and where the imports exceed the weekly item of exports. In four years, as we quoted, viz., 1867-70, while the population only increased 15 per cent., the exports grew by 25 per cent. It was then that we began to take our place in the foremost rank of the producers in the world, a position which, thanks to the discovery of the tin mines and the Palmer Gold Field, we still continue to maintain.

#### Natural History of Queensland.

Natural history.

In this department, Queensland, though strictly Australian in nearly every type, yet differs somewhat from her southern sisters. It is not our province here to enlarge fully on the field which Krefft, Diggles, Gould, Coxen, and others have made their valued researches in; but we will endeavour merely to touch on those points where Queensland varies from the other colonies.

## Alligator,

The alligator (so called), 25 feet long, 3 tons in weight, and with holes in the upper jaw, through which the two great teeth of the lower jaw protrude (and form a fatal "clench" indeed), is abundant in the Burdekin and other northern streams. This reptile is a specialty of Queensland. Its sight is not keen, but its hearing is very acute, and so it exaggerates all noise, and it is, consequently, easily terrified by splashing or shouting, &c.

## Birds.

The rifle bird of Cape York, with its black purple velvet plumage, and gold-green markings, is the handsomest bird of its class in Australia. The golden oriole of Queensland is far more beautiful than the duller plumaged ones of Manilla and China are; and although we have no parrots that can vie with the immense and multi-coloured macaws of Guiana, and no bird of any class, perhaps, that could compete for beauty with the *calurus resplendens* of Guatemala, or the Impeyan pheasant, still our small ground parrot and some of our doves and cockatoos are very elegant. We are unable to state whether our wide-winged eagle is identical with the species which carries off lambs on the Lower Murray; but we have some formidable owls, a cassowary, and a tiger-cat of fair size. Our snakes differ little from those down south; and the death-adder, with its flat belly, triangular back, and mercifully repulsive shape,

## Reptiles.

does duty for tic polonga, cobra, and rattlesnake, in Northern as in Southern Australia. Our pythons are somewhat larger than those of the south, and so are our butterflies and moths; amongst the former the ornithoptera and papilionæ are conspicuous for size and beauty. The lycœnæ and uranidæ scarcely less so. In the quality of its fish, Queensland is behind the southern colonies. There is nothing here to approach the matchless "trumpeter" of Hobart Town in flavour, but our crabs and prawns can vie in point of size and relish with any known ones. Our inferiority in table fish simply arises from our position in latitude, which spoils fish for English palates all the world over. You cannot reasonably look for salmon, turbot, and soles in the tropics; but our snipe and wild pigeons, ducks, &c., are as good as need be wished for anywhere; and of forest game, of the limited Australian repertoire in this line, we are as well off as any of our sister colonies.

## Fish.

In the body of the Court the exhibits were arranged in four groups, viz., "Mining," "Agricultural," "Pastoral," and "Miscellaneous" Products.

## Wild fowl.

## Forest game.

Opposite Divisions 10A and 10, were placed samples in bulk of the principal

Exhibition of  
mining products.

## MINING PRODUCTS, including—

## Gold.

## Class 100.

## GOLD.

Large Nugget of Gold from Cawarral Diggings. Exhibited by Queensland Government.

Two other Gold Nuggets. Exhibited by Queensland Government.

18 specimens, Auriferous Quartz, Gympie Diggings. Exhibited by Queensland Government.

Gold specimens from Cloncurry Diggings. Exhibited by Queensland Government.

Auriferous Quartz from Ravenswood Diggings. Exhibited by Queensland Government.

Auriferous Quartz from Rockhampton Diggings. Exhibited by Queensland Government.

Nugget of Gold from Diggings near Bowen. Exhibited by Queensland Government.

Large collection of Auriferous Pyrites from Ravenswood. Exhibited by Queensland Government.

## Copper.

## COPPER.

Half ton Smelted Metal (ingots) from Mount Perry Mine. This mine paid in dividends last year a sum equal to two-thirds its working capital. Exhibited by Queensland Government.

Half ton Smelted Pure Metal (ingots) Peak Downs Mine. Copper to the value of more than 1,000,000*l.* sterling has been raised from this mine since it was first opened. Exhibited by Queensland Government.

One ton Smelted Pure Metal Peak Downs Mine (for sale). Exhibited by Peak Downs Company.

## COPPER ORE.

Copper ore.

8 cwt. Native Copper. Cloncurry. Exhibited by Captain Henry, Great Australian Mining Company.

Malachite, Peak Downs Mine. Exhibited by Peak Downs Mining Company.

Large slab Copper Ore, showing thickness and character of Normanby Mine; Mount Perry District. Exhibited by Normanby Mining Company.

Varieties: Copper Ore, Mount Perry Mine. Exhibited by Mount Perry Mining Company.

Varieties of Copper Ore from Warroo, 45 miles from Stanthorpe. Exhibited by Queensland Government.

Four pieces of Copper Pyrites. Exhibited by Mr. Matthew Perry.

One piece of White Metal (copper sulphuret). One piece of Green Carbonate. Exhibited by Mr. Matthew Perry.

## TIN.

Tin.

One ingot, Pure Tin, exhibited by J. Harris. Three ingots Pure Tin, Mount Marlay Smelting Works, Stanthorpe; 1 ton Pure Tin (Ingots) smelted by Bulimba Tin Smelting Company, from Stanthorpe Tin Ore. Exhibited by Queensland Government.

One ton Pure Tin (ingots), smelted by Bulimba Tin Smelting Company. (For Sale.) Exhibited by Bulimba Smelting Company.

Complete Collection of Tin Ores and rocks from the tin mining district of Stanthorpe. Collected and arranged by Walter C. Hume, Esq., Government Commissioner for Mineral Lands, Stanthorpe. Exhibited by W. C. Hume, Esq.

Three half cwt. samples of Stream Tin, each coarse, middling, and fine, from Stanthorpe District. Exhibited by Mount Marlay and Brisbane Tin Mining Company.

Wash dirt (rich), and Conglomerate, 1 cwt. Exhibited by Mount Marlay and Brisbane Tin Mining Company.

Twenty-four bottles, Tin Ore, each corresponding to number on Map of tin selections, prepared by J. De Fore Tyrell, Esq. Exhibited by J. De Fore Tyrell, Esq.

Thirty-six bottles of Tin Ore, Powder and Assay, 12 varieties from Stanthorpe District. Exhibited by J. De Fore Tyrell, Esq.

Trophy of Tin Ore, indications, &c. Exhibited by D. Aplin, Esq.

Glass case of Stratified Alluvium in which Tin Ore is found. Exhibited by Brisbane Tin Mining Company.

Class 101.

## IRON ORE.

Iron ore.

Chrome Iron Ore, from large lode, near Ipswich. Exhibited by Proprietors of Mine.

Chrome Iron, 1 cwt. Exhibited by Mr. Alfred Footo.

Iron Ore, Flagstone Creek, near Ipswich; contains 52 per cent. Metallic Iron. Exhibited by Proprietors of Mine.

Hæmatite from Pine Mountain, West Moreton District; contains 45 per cent. Metallic Iron. Exhibited by Proprietors of Mine. N.B.—Iron Ore of all kinds, and in unlimited quantity, occurs in all parts of Queensland, in greatest abundance in the older Coal Measures.

Bag of Iron Sand from Stanthorpe, as separated from Tin in last cleaning process.

## ANTIMONY ORE.

Antimony ore.

Block of Antimony Ore, from lode on St. John's Creek, in the Burnett Districts. Exhibited by Proprietors of Mine. N.B.—Lithographed copies of the Report of Carl Staiger, Esq., Government Geologist, were placed for reference near this specimen.

2 cwt. of Antimony Ore from St. John's Creek. Exhibited by A. C. Gregory.

Half ton Star Regulus of Antimony, prepared from Ore from St. John's Creek. Exhibited by A. C. Gregory.

## MERCURY ORES.

Mercury ore.

*Cinnabar*. From Kilkivan, about 50 miles from Maryborough. Exhibited by Proprietors of Mine.

## BISMUTH ORES.

Bismuth ore.

Samples of Native Bismuth and Carbonate of Bismuth from the Cloncurry Mining District. Exhibited by Queensland Government.

**Manganese ore.****MANGANESE ORE.**

Samples of Manganese Ore from near Gladstone; contains 77 per cent. of Per Oxide of Manganese. Exhibited by Queensland Government.

**Plumbago.****PLUMBAGO.**

1 cwt. Plumbago, from mine opened in Stanthorpe District. Exhibited by Proprietors of Mine.

Kaolin and Fire bricks, as used in the smelting works of the Mount Marlay Company, near Stanthorpe, obtained in that District. Exhibited by Mount Marlay Company.

**Building stone.****BUILDING STONE.**

From Brisbane and Warwick. Exhibited by Queensland Government.

**Coal.****COAL.**

Sample of Coal from Aberdare Mine, which is situated five miles from Ipswich. Exhibited by Proprietors of Mine.

Sample of Coal from Tivoli Mine, situated two miles from Ipswich. Exhibited by Proprietors of Mine.

Sample of Coal from Allora Mine, situated about 1 mile west of Allora. Exhibited by Proprietors of Mine.

Sample of Coal from Flagstone Creek Mine. Exhibited by Proprietors of Mine.

Sample of Coal from Rosewood Mine. Exhibited by Proprietors of Mine.

Sample of Coal from Blackfellows Creek, near Gatton. Exhibited by Proprietors of Mine.

Sample of Coal from Bingera Mine. Exhibited by Proprietors of Mine.

1 Block Coal. Exhibited by Bland and Wright, Perseverance Mine, Ipswich.

Samples of Coal from Ipswich; three Collections, Coke prepared from same, with collection of Fossils. Exhibited by Queensland Government.

Samples of Coal, Fossils, Kaolin, and Glass Case showing strata passed through at the Clifton Coal Mine. Exhibited by Proprietors of Mine.

1 block of Coal from Warwick. Exhibited by Queensland Government.

**Precious stones.****PRECIOUS STONES.**

100 specimens of Opals from the Barcoo. Exhibited by Mr. Bishop.

Specimens of Calcedony, Agate, from Agate Creek, Gilbert River. Exhibited by Queensland Government.

Polished specimens of Serpentine, from near Marlboro, Queensland. Exhibited by Queensland Government.

Opposite Divisions 11 and 12 were ranged exhibits in bulk of

**AGRICULTURAL PRODUCTS, including—****Exhibition of  
agricultural pro-  
ducts.  
Sugar.****CL. 659.****SUGAR.**

1 bag of Sugar. Density of liquor, 9° to 10° Baume. Price of crop, 26s. to 27s. per cwt. Soil—Medium Clay Loam. Exhibited by H. G. Grimes.

1 bag of Sugar, Gairlock Plantation, Albert River. Prepared in open battery, Wetzel Pan, from Salangore Cane, 15 months old. Exhibited by McKenzie.

1 bag of Sugar, Herbert River. Exhibited by F. Neame & Co.

1 bag of Sugar, Clydesdale. Prepared in open flat pans, made by R. R. Smellie, Wetzel Pan, from Chicago cane, 10 months old; 20 tons of cane per acre, yield 80 cwt. of Sugar per acre; black soil, sandy subsoil, well drained. Exhibited by William Gibson and Sons.

2 bags of Sugar, Loganholm, Logan River. Exhibited by Fryar and Strachan.

1 bag of Sugar, Moyea. Exhibited by J. M. Black.

1 bag of Sugar, Loganholm, Logan River. Exhibited by Fryar and Strachan.

1 bag of Sugar, Alexandria Plantation, Mackay. Made from black Java Cane, 15 months old. 8½ measured acres yielded 3 tons 2 cwt. 2 qrs. dry sugar net, and 48 gallons of molasses per acre. Exhibited by J. E. Davidson.

1 bag of Sugar, Helenfield, Tingalpa. Exhibited by Johnson Brothers.

1 bag of Sugar, Ageston Plantation, Exhibited by W. H. Cauldery.

1 bag of Sugar, Antigua, Maryborough. Exhibited by A. H. Brown.

2 bags of Sugar, Beenleigh. Exhibited by Davey and Goody.

1 bag of Sugar, Benowa. Prepared in common pan, direct from battery (no steam boiler, made from one year old Ribbon cane "Ratoons"). Exhibited by Robert Muir.

- 1 bag of Sugar, Government Penal Establishment. Exhibited by John McDonald.  
1 bag of Sugar, Yengarie. Exhibited by Tooth and Cran.

## SPIRITS DISTILLED FROM QUEENSLAND SUGAR AND MOLASSES.

Spirits distilled  
from sugar and  
molasses.

## CL. 660.

- 1 keg of Rum, Ageston. Exhibited by W. H. Couldery.  
1 keg of Rum, Iindah. Exhibited by Ramsey Brothers.  
1 keg of Rum, Caboolture. Exhibited by G. Raff.  
1 keg of White Spirit, Ageston. Exhibited by W. H. Couldery.  
1 keg of White Spirit, Iindah. Exhibited by Ramsey Brothers.

## WINE.

Wine.

12 bottles of Red Wine. Locality—Assmanshausen, Sandy Creek, Agricultural Reserve, Warwick. Date of vintage—1873. Name of grape—Black Spanish. Name of wine—Assmanshausen. Colour—Red. Character—Light-bodied wine, pure juice of the grape. Age of vine—10 years or less. Nature of soil—Gravelly loam, greyish colour, 10 acres cultivated. How cultivated—Land subsoiled and trenched yearly, 1 foot deep. How trained—Trained to stakes and wires.

12 bottles White Wine. Locality—Assmanshausen, Sandy Creek, Agricultural Reserve, Warwick. Date of Vintage—1873. Name of Grape—White Verdillo. Name of Wine—White Assmanshausen. Colour—White. Character of Wine—Light-bodied wine, pure juice of grape. Age of Vines—10 years and less. Nature of Soil—Gravelly loam, greyish colour, 10 acres cultivated. How cultivated—Land subsoiled and trenched yearly, 1 foot deep. Vines, how trained—Trained to stakes and wires. Exhibited by Kircher.

12 bottles of White Wine. Location—Silverburg, Agricultural Reserve, Swan Creek, Warwick. Date of Vintage—1873. Name of Grape—White Reisling. Name of Wine—White Silverburg. Colour—White. Character of Wine—Light-bodied wine, pure juice of the grape. Ages of Vines—Six years. Nature of soil—Brown loam, 9 acres under cultivation. How cultivated—Land subsoiled, and trenched yearly. Vines, how trained—Trained to stakes. Exhibited by David Mauch.

12 bottles of White Wine. Location—Warrill Creek, Ipswich. Date of Vintage—1874, February 15th. Name of Grape—Verdeilho. Name of Wine—Warrilla. Colour—Golden Yellow. Character of Wine—Liqueur. Age of Vines—3 years. Nature of soil—The soil is a shallow alluvial, resting upon a subsoil of argillaceous clay, the whole being thoroughly drained to a depth of from 4 to 5 feet. The aspect is southerly, and the area under cultivation is 13 acres. How cultivated—The cultivation is mainly with horse labour, the implements used being the "Georgia Bull Tongue," and a "Cultivator" to stir the ground to a shallow depth, the soil more immediate to the vines and underneath the trellising being well dug with forks. Vines, how trained—The vines are planted 6 by 5 feet, and are trained to a 3-wire trellis. Exhibited by Irwin Brothers.

## CL. 657.

## FLOUR AND WHEAT MEAL.

Flour and wheat  
meal.

- 1 bag of Flour, 56 lbs. Allora. Exhibited by Mr. F. Keates.  
1 bag of Wheat Meal, 56 lbs. Allora. Exhibited by Mr. F. Keates.

## CL. 658.

## ARROWROOT.

Arrowroot

- 1 case of Arrowroot. Exhibited by F. Lahey.  
1 case of Arrowroot. Exhibited by G. O. S. Grimes.  
1 case of Arrowroot. Exhibited by Lane.  
1 tin of Arrowroot. Exhibited by W. Marks.  
1 tin of Arrowroot Biscuit. Exhibited by Brokleman.

## CL. 623.

## TOBACCO.

Tobacco.

- 2 boxes of Tobacco. Exhibited by J. H. Hocker.  
1 box of Cigars. Exhibited by J. H. Hocker.  
1 small box of Cigarettes. Exhibited by J. H. Hocker.  
7 varieties of Tobacco Leaf. Exhibited by J. H. Hocker.

## CL. 668.

## SILK.

Silk.

- 1 sample of Silk (Raw Silk in Skein). Ipswich. Exhibited by C. F. Chubb.  
1 sample of Silk (reeled in form of Tram and organised for weaving). Exhibited by C. F. Chubb.  
1 sample of Silk (sample of manufacture, in form Scarf). Exhibited by C. F. Chubb.

Samples of Silk (cocoons and Japanese Varieties). Ipswich. Exhibited by Mrs. Hine.

Samples of Silk and Cocoons. The Penal Establishment. Exhibited by John McDonald.

Coffee.

Cl. 623.

COFFEE.

1 packet of Coffee Beans. Exhibited by F. E. Chubb.

Coffee Leaves dried as Tea. Redbank. Exhibited by W. R. Alexander.

Candied fruits.

Cl. 656.

CANDIED FRUITS, &C.

1 case of Candied Ginger. Exhibited by W. H. Hayes.

1 case of Candied Orange Peel. Exhibited by W. H. Hayes.

1 case of Candied Lemon Peel. Exhibited by W. H. Hayes.

1 case of Candied Pine Apple. Exhibited by W. H. Hayes.

1 case of Candied Rock Melon. Exhibited by W. H. Hayes.

1 case of Candied Citron. Exhibited by W. H. Hayes.

6 bottles of Chutney. Stanley's, South Brisbane. Exhibited by J. H. Boreham.

6 bottles of Tomato Sauce; 12 varieties of Chili Pepper; Rosella and other Jams. Exhibited by Mr. MacFarlane.

Opposite Divisions XIII. and XIV. were arranged the bulky Exhibits of

Cl. 667.

PASTORAL PRODUCTS, including—

Exhibition of  
pastoral pro-  
ducts.  
Wool.

2 Fleeces *Clothing* Wool, from Ewes bred by Mr. Bertie le Parr Chiverton, lat. 28° 12' S.; long. 152° 16' E. Fed solely in paddocks on indigenous grasses. Eleven months' growth, shown in the grease.

Pure Australian Merino fleece. Exhibited by Bertie le Parr Chiverton.

1 Fleece *Clothing* Wool, washed, grown by Mr. Donald Gunn, of Pikedale, lat. 28° 43' S.; long. 151° 38' E. Flocks originally from Negretti. Fed in paddocks on indigenous grasses only. Geological formation, trap and slate. One of the most healthy sheep-runs in Queensland. The maximum price per lb. was forty-one and a half pence (3s. 5½d.), and the general average thirty-three and a half pence (2s. 9½d.), at last London sales, 1874. Exhibited by Donald Gunn.

1 Ram's Fleece *Clothing* Wool, grown by Mr. Donald Gunn, Pikedale. Shown in the grease from a three years' old ram; weight of fleece, 12½ lbs. Exhibited by Donald Gunn.

1 Ewe's Fleece *Combing* Wool, grown by Messrs. Gore and Co., Yandilla. Lat. 27° 50' S.; long. 131° 35' E. Sheep bred within their own blood for 21 years; fed in paddocks entirely on indigenous grasses; shown in the grease. Soil principally black volcanic. Exhibited by Gore & Co.

1 Young Ram's Fleece fine *Combing* Wool, grown by George Clark, Esq., East Talgai, lat. 27° 38' S.; long. 151° 59' E. Finest combing wool grown in Queensland. Sheep improved by Tasmanian merinos, bred pure for more than 50 years. Shown in the grease. Exhibited by George Clark.

4 Fleeces pure Merino *Clothing*, 320 days' growth. Bred by C. H. Green, Esq., Goomburra, Darling Downs, lat. 28° 5' S.; long. 152° 10' E. Fed solely in paddocks of indigenous grasses. Shown in the grease. Exhibited by C. H. Green.

3 Ram's Fleeces, pure Australian *Clothing* Merino in the grease; bred by B. C. Parr, Esq., 11 months' growth. Exhibited by B. C. Parr.

1 Fleece from pure *Clothing* Merino, bred by Messrs. Marshall and Slade, Glengallan, lat. 28° 5' S.; long. 152° 20' E. From ram "Sultan," for two years champion clothing ram at the Agricultural Society's Show, Toowoomba (1874-5); eight years old; weight of fleece, 11½ lbs. in the grease, with samples kept back for station. Exhibited by Marshall and Slade.

1 Fleece, pure *Clothing* Merino, from the ewe "Empress." Bred by Marshall and Slade. Weight in the grease, 9 lbs., with samples kept back. This ewe was champion at the Royal Agricultural Company's Exhibition in 1874. The brand of this clip, M. and D., has been long favourably known in the London market. Exhibited by Marshall and Slade.

1 Fleece, *Clothing* Wool, from ram bred by the North British Australian Investment Company (L. E. Lester, Manager), Rosenthal, lat. 28° 12'; long. 152° E. Flocks originally from Saxon merino; weight of fleece in grease, 12 lbs. at 11 months' growth. Exhibited by L. E. Lester.

1 Ewe Fleece *Clothing*, from a ewe belonging to same breeders; weight in grease at 10 months' growth, 8 lbs. 10 oz. Exhibited by L. E. Lester.

1 Ewe Fleece *Clothing*; same breeders; weight in grease, 6 lbs. 8 oz. Exhibited by L. E. Lester.

1 bale washed Wool, from Westbrook Station; grown by Messrs. Jennings and Shanahan, lat. 27° 40' S.; long. 151° 24' E. Pure Australian merino. Exhibited by Jennings and Shanahan.

8 Fleeces pure Merino *Combing* Wool, from two years old. Rams bred by C. B. Fisher, Esq., Headington Hill, lat. 27° 51' S.; long. 151° 49' E. This clip has been bred in Adelaide 40 years in and into their own blood, and have been acclimatised in Queensland for seven years. The clip was pronounced by the Bradford Chamber of Commerce the most essentially combing merino wool received in that market. Exhibited by C. B. Fisher.

Bale Washed Wool; Messrs. Shanahan and Jennings. Exhibited by Shanahan and Jennings.

Large Wardrobe, with three fleeces wool, from G. H. Davenport, Headington Hill, Darling Downs. Exhibited by G. H. Davenport.

#### SAMPLE CASE containing the following DESCRIPTIONS of WOOL.

No.	Description.	Condition.	Breed of Sheep.
1	Fine clothing	Cold water washed	Pure Australian Merino.
2	Combing	In the grease	Leicester cum Merino, from a two-year old, the offspring of a pure Leicester ram, and a pure Merino ram.
3	Fine clothing	Cold water washed	Pure Australian Merino.
4 to 12	Fine combing	In the grease	Ditto.
13 to 31	Fine clothing	Ditto	Sheep descended from pure Saxony Merino.
32	Very fine clothing	Cold water washed	Pure Australian Merino.
33 to 46	Fine clothing	In the grease, lambs	Same as 13 to 31.
47 to 49	Ditto	Ditto	Ditto.
50 to 52	Ditto	Ditto ewes	Ditto.

The exhibitors, Messrs. Fenwick and Scott, give the following information:—

Sheep in Queensland, 31st December 1874, 6,000,000 sheep; clothing wool produced, 15,000,000 lbs., washed; or say, 30,000,000 in grease. 1½,000,000 sheep; combing wool produced 3½,000,000 lbs., washed; or say, 7½,000,000 in grease. Total, 7½,000,000 sheep, producing 87½,000,000 lbs. wool in grease.

Opposite Divisions XV., XVI., XVII., XVIII. were arranged exhibits of a

#### Miscellaneous Character.

Miscellaneous exhibits.

First in importance were the two collections, one in the rough, the other polished, of

#### TIMBERS.

Specimens of timbers.

The first consisted of 206 slabs of the most useful Queensland timbers, 3 ft. long by 6 in. square with bark on.

Ornamental Inlaid Table Top to illustrate the same.

About 2 cwt. squared timber, 2 ft. long, from Warwick district.

Ornamental Inlaid Table to illustrate the same.

Timber from Lower Herbert, Daintree River Cedar, and Endeavour Gum.

A full description of these was attached to the specimens. They were collected and described by Walter Hill, Esq., the Director of the Government Botanical Gardens, Brisbane.

The second collection of polished woods was also arranged by Walter Hill, Esq.; they were, however, when in the rough, subjected to long immersion in sea water, owing to the wreck of the ship in which they were being conveyed to England, and on that account hardly do justice to their value to the cabinet maker.

Their description is as follows:—

#### THE TIMBERS OF QUEENSLAND.

CL. 600, 601.

#### CONIFERÆ.

1. *Araucaria Bidwillii*, Hook. *Bunya Bunya*. Diameter, 30 to 48 ins.; height, 100 to 220 ft.

1A. Ditto.

1B. Ditto.

2. *Araucaria Cunninghamii*, Ait. *Moreton Bay Pine*. Diameter, 36 to 66 in.; height, 150 to 200 ft.

2A. Ditto.

3. *Dammara robusta*, Moore. *Kawrie or Dundathu Pine*. Diameter, 36 to 72 in.; height, 80 to 130 ft.

4. *Callitris columellaris*, F. Muell. *Cypress Pine*. Diameter, 20 to 30 in.; height, 40 to 60 ft.

5. *Callitris verrucosa*, R. Br. *The Desert Cypress Pine*. Diameter, 12 to 24 in.; height, 50 to 70 ft.

6. *Callitris Endlicheri*, Parl. *The Mountain Cypress Pine*. Diameter 9 to 18 in.; height, 40 to 50 ft.

7. *Podocarpus elatus*, R. Br. *She Pine*. Diameter, 20 to 36 in.; height, 50 to 80 ft.

#### AMENTACEÆ.

8. *Casuarina tenuissima*, Sieb. *River Oak*. Diameter, 18 to 22 in.; height, 40 to 70 ft.

9. *Casuarina leptoclada*, Miq. *The Erect She Oak*. Diameter, 9 to 15 in.; height, 20 to 30 ft.

10. *Casuarina equisetifolia*, Forst. *Swamp Oak*. Diameter, 12 to 30 in.; height, 50 to 70 ft.

11. *Casuarina torulosa*, Ait. *Forest Oak*, *Beefwood*. Diameter, 9 to 15 in.; height, 30 to 35 ft.

11A. Ditto.

12. *Casuarina Cunninghamiana*, Miq. *Fire Oak*. Diameter, 6 to 10 in.; height, 20 to 30 ft.

12A. Ditto.

#### MELIACEÆ.

13. *Cedrela Toona*, Roxb. *Red Cedar*. Diameter, 24 to 76 in.; height, 100 to 150 ft.

13A. Ditto.

13B. Ditto.

14. *Flindersia Australis*, R. Br. *Flindosa*. Diameter, 36 to 48 in.; height, 80 to 100 ft.

15. *Flindersia Oxleyana*, F. Muell. *Light-Yellow Wood*. Diameter, 24 to 42 in.; height, 80 to 100 ft.

16. *Flindersia Bennettiana*, F. Muell. *Bogum Bogum*. Diameter, 18 to 26 in.; height, 70 to 90 ft.

16A. Ditto.

17. *Flindersia maculosa*, F. Muell. *Spotted Tree of the Colonists*. Diameter, 12 to 18 in.; height, 30 to 40 ft.

18. *Owenia venosa*, F. Muell. *Sour Plum*. Diameter, 12 to 24 in.; height, 40 to 65 ft.

19. *Owenia cerasifera*, F. Muell. *Sweet Plum*. Diameter, 9 to 18 in.; height, 25 to 35 ft.

20. *Amoora nitidula*, Benth. Diameter, 18 to 30 in.; height, 70 to 90 ft.

20A. Ditto.

21. *Synoum glandulosum*, A. Juss. Diameter, 15 to 24 in.; height, 35 to 60 ft.

21A. Ditto.

22. *Dysoxylon Muelleri*, Benth. *Pencil Cedar*. Diameter, 20 to 35 in.; height, 70 to 90 ft.

22A. Ditto.

22B. Ditto.

23. *Melia composita*, Willd. Diameter, 15 to 20 in.; height, 50 to 60 ft.

23A. Ditto.

#### SIMARUBEÆ.

24. *Ailanthus imberbiflora*, F. Muell. Diameter, 20 to 28 in.; height, 50 to 70 ft.

24A. Ditto.

#### RUTACEÆ.

25. *Bosistoa sapindiformis*, F. Muell. Diameter, 6 to 12 in.; height, 15 to 20 ft.

25A. Ditto.

26. *Citrus australis*, Planch. *Native Orange*. Diameter, 6 to 14 in.

27. *Citrus australasica*, F. Muell. *Native Lime*. Diameter, 6 to 10 in.; height, 15 to 20 ft.

27A. Ditto.

28. *Atalantia glauca*, Hook. *The Native Cumquat*. Diameter, 2 to 6 in.; height, 8 to 15 ft.  
 29. *Acronychia Baueri*, Schott. Diameter, 6 to 12 in.; height, 16 to 24 ft.  
 30. *Acronychia lævis*, Forst. Diameter, 15 to 20 in.; height, 30 to 50 ft.  
 31. *Zanthoxylon brachyacanthum*, F. Muell. *Satin Wood*. Diameter, 6 to 9 in.; height, 20 to 30 ft.  
 32. *Geijera parviflora*, Lindl. Diameter, 6 to 12 in.; height, 20 to 30 ft.  
 33. *Geijera Muelleri*, Benth. *Balsam Capiwi Tree*. Diameter, 12 to 18 in.; height, 40 to 60 ft.  
 34. *Evodia micrococca*, F. Muell. Diameter, 6 to 10 in.; height, 20 to 30 ft.

## CELASTRINEÆ.

35. *Celastrus Dispermus*, F. Muell. Diameter, 3 to 5 in.; height, 12 to 16 ft.  
 35a. Ditto.  
 36. *Denhamia pittosporoides*, F. Muell. Diameter, 6 to 8 in.; height, 20 to 30 ft.  
 37. *Denhamia obscura*, Meisn. Diameter, 3 to 5 in.; height, 12 to 20 ft.

## RHAMNEÆ.

38. *Alphitonia excelsa*, Reissek. *Mountain or Red Ash*. Diameter, 18 to 24 in. height, 45 to 60 ft.

## PITTOSPOREÆ.

39. *Pittosporum rhombifolium*, A. Cunn. Diameter, 6 to 12 in.; height, 40 to 55 ft.  
 40. *Pittosporum bicolor*, Hook. Diameter, 6 to 21 in.; height, 30 to 40 ft.  
 41. *Pittosporum phyllæroides*, D.C. Diameter, 4 to 6 in.; height, 20 to 35 ft.

## STERCULIACEÆ.

42. *Tarrietia argyrodendron*, Benth. *Silver Tree*. Diameter, 24 to 34 in.; height, 70 to 90 ft.  
 43. *Tarrietia actinodendron*, F. Muell. Diameter, 18 to 30 in.; height, 60 to 70 ft.  
 44. *Commersonia echinata*, Forst. Diameter, 6 to 12 in.; height, 20 to 30 ft.

## SAPINDACEÆ.

45. *Cupania xylocarpa*, A. Cunn. Diameter, 12 to 24 inches; height 40 to 60 feet.  
 46. *Cupania serrata*, F. Muell. Diameter, 8 to 14 inches; height 20 to 30 feet.  
 47. *Diploglottis Cunninghamii*, Hook. *Native Tamarind*. Diameter, 12 to 20 inches; height, 40 to 55 feet.  
 48. *Cupania semiglaucæ*, F. Muell. Diameter, 10 to 20 inches; height, 30 to 60 feet.  
 49. *Ratonia pyriformis*, Benth. Diameter, 10 to 18 inches; height, 30 to 45 feet.  
 50. *Nephelium tomentosum*, F. Muell. Diameter, 10 to 15 inches; height, 30 to 40 feet.  
 51. *Heterodendron oleæfolium*, Desf. Diameter, 4 to 10 inches; height 20 to 30 feet.  
 52. *Heterodendron diversifolium*, F. Muell. Diameter, 4 to 6 inches; height, 10 to 15 feet.  
 53. *Harpullia pendula*, Planch. *Tulip Wood*. Diameter, 14 to 24 inches; height, 50 to 60 feet.  
 54. *Dodonæa triquetra*, Andr. *Hop Bush*. Diameter, 3 to 4 inches; height, 10 to 12 feet.

## ANACARDIACEÆ.

55. *Rhus rhodanthema*, F. Muell. *Dark Yellow Wood, K.* Diameter, 18 to 24 inches; height, 50 to 70 feet.

## RUBIACEÆ.

56. *Sarcocephalus cordatus*, Miq. *Leichhardt's Tree*. Diameter, 24 to 30 in.; height, 40 to 60 ft.  
 57. *Ixora Pavetta*, Roxb. Diameter, 2 to 4 in.; height, 8 to 10 ft.  
 58. *Hodgkinsonia ovatiflora*, F. Muell. Diameter, 6 to 10 in.; height, 12 to 20 ft.

59. *Canthium lucidum*, Hook. and Arm. Diameter, 6 to 12 in.; height, 20 to 30 ft.  
 59A. Ditto.  
 60. *Canthium oleifolium*, Hook. Diameter, 4 to 10 in.; height, 25 to 30 ft.  
 61. *Canthium latifolium*, F. Muell. Diameter, 8 to 12 in.; height, 25 to 30 ft.  
 62. *Canthium vacciniifolium*, F. Muell. Diameter, 2 to 4 in.; height, 6 to 10 ft.  
 62A. Ditto.  
 63. *Cælospermum paniculatum*, F. Muell. Diameter, 3 to 5 in.; height, 100 to 150 ft.

## MYRTACEÆ.

64. *Callistemon lanceolatus*, D. C. *Bottle-brush Tree*. Diameter, 12 to 18 in.; height, 30 to 40 ft.  
 65. *Callistemon salignus*, D. C. *Broad-leaved Tea Tree*. Diameter, 18 to 24 in.; height, 40 to 60 ft.  
 66. *Melaleuca linariifolia*, Sm. Diameter, 20 to 24 in.; height, 30 to 40 ft.  
 67. *Melaleuca nodosa*, Sm. *Tea Tree*. Diameter, 10 to 20 in.; height, 30 to 40 ft.  
 68. *Angophora subvelutina*, F. Muell. *Apple Tree*. Diameter, 20 to 26 in.; height, 40 to 60 ft.  
 69. *Eucalyptus pilularis*, Sm. *Black-butt*. Diameter, 24 to 40 in.; height, 60 to 80 ft.  
 70. *Eucalyptus microcorys*, F. Muell. Diameter, 18 to 30 in.; height, 60 to 80 ft.  
 71. *Eucalyptus hemiphloia*, F. Muell. *Yellow Box*. Diameter, 20 to 30 in.; height, 40 to 60 ft.  
 71A. Ditto.  
 72. *Eucalyptus siderophloia*, Benth. *Ironbark*. Diameter, 20 to 30 in.; height, 60 to 80 ft.  
 73. *Eucalyptus melanophloia*, F. Muell. *Silver-leaved Ironbark*. Diameter, 18 to 20 in.; height, 30 to 60 ft.  
 74. *Eucalyptus maculata*, Hook. *Spotted Gum*. Diameter, 20 to 30 in.; height, 60 to 80 ft.  
 74A. Ditto.  
 75. *Eucalyptus saligna*, Sm. *Grey Gum*. Diameter, 24 to 34 in.; height, 60 to 80 ft.  
 76. *Eucalyptus resinifera*, Sm. *Red Mahogany*. Diameter, 20 to 30 in.; height, 60 to 70 ft.  
 76A. Ditto.  
 77. *Eucalyptus corymbosa*, Sm. *Bloodwood*. Diameter, 24 to 30 in.; height, 50 to 60 ft.  
 77A. Ditto.  
 78. *Eucalyptus globulus*, Sm. *Blue Gum*. Diameter, 30 to 48 in.; height, 70 to 90 ft.  
 79. *Eucalyptus tereticornis*, Sm. *Red Gum*. Diameter, 18 to 30 in.; height, 60 to 80 ft.  
 80. *Eucalyptus Stuartiana*, F. Muell. *Turpentine Tree*. Diameter, 24 to 36 in.; height, 60 to 80 ft.  
 81. *Eucalyptus fibrosa*, F. Muell. *Stringy Bark*. Diameter, 18 to 24 in.; height, 40 to 60 ft.  
 82. *Eucalyptus tessellaris*, F. Muell. *Moreton Bay Ash*. Diameter, 14 to 24 in.; height, 30 to 60 ft.  
 83. *Myrtus acmenioides*, F. Muell. Diameter, 12 to 18 in.; height, 30 to 40 ft.  
 83A. Ditto.  
 84. *Eugenia Smithii*, Poir. *Lilly Pillies*. Diameter, 12 to 18 in.; height, 30 to 40 ft.  
 85. *Myrtus Hillii*, Benth. *Scrub Ironwood*. Diameter, 6 to 12 in.; height, 20 to 40 ft.  
 86. *Rhodamnia trinervia*, Blum. Diameter, 10 to 18 in.; height, 20 to 30 ft.  
 87. *Rhodomyrtus psidioides*, Benth. Diameter, 12 to 20 in.; height, 30 to 40 ft.  
 88. *Rhodamnia argentea*, Benth. Diameter, 15 to 22 in.; height, 40 to 60 ft.  
 89. *Tristania conferta*, R. Br. *Box*. Diameter, 36 to 50 in.; height, 80 to 100 ft.

## PROTEACEÆ.

90. *Grevillea robusta*, Cunn. *Silky Oak*. Diameter, 30 to 40 in.; height, 80 to 100 ft.  
 91. *Macadamia ternifolia*, F. Muell. *Queensland Nut*. Diameter, 30 to 40 in.; height, 30 to 50 ft.

92. *Orites excelsa*, R. Br. Diameter, 6 to 14 in. ; height, 30 to 60 ft.  
 92. Ditto.  
 93. *Banksia integrifolia*, Linn. *Beef Wood*. Diameter, 8 to 12 in. ; height, 20 to 30 ft.  
 94. *Persoonia lucida*, R. Br., Var. *latifolia*, A. Cunn. Diameter, 3 to 7 in. ; height, 10 to 20 ft.  
 95. *Grevillea Hilliana*, F. Muell. Diameter, 10 to 18 in. ; height, 10 to 60 ft.

## THYMELÆÆ.

96. *Exocarpus latifolia*, R. Br. *Broad-leaved Cherry Tree*. Diameter, 6 to 9 in. ; height, 12 to 25 ft.  
 97. *Exocarpus cupressiformis*, R. Br. *Cherry Tree*. Diameter, 4 to 8 in. height, 10 to 16 ft.

## SANTALACEÆ.

98. *Santalum lanceolatum*, R. Br. *Sandal Wood*. Diameter, 3 to 6 in. ; height, 15 to 25 ft.  
 98A. Ditto.

## MYOPORINÆÆ.

99. *Eremophila Mitchelli*, Benth. *Bastard Sandal Wood*. Diameter, 6 to 12 in. ; height, 20 to 30 ft. -  
 100. *Myoporum acuminatum*, R. Br., var. *parviflorum*, Benth. Diameter, 4 to 6 in. ; height, 12 to 15 ft.

## VERBENACEÆ.

101. *Avicennia officinalis*, Linn. *Mangrove*. Diameter, 19 to 20 in. ; height, 20 to 30 ft.  
 102. *Gmelina Leichhardtii*, F. Muell. *Beech*. Diameter, 24 to 36 in. ; height, 80 to 100 ft.  
 103. *Vitex lignum-vitæ*, A. Cunn. *Scrub Lignum Vita*. Diameter, 20 to 24 in. ; height, 50 to 70 ft.  
 103A. Ditto.

## TILIACEÆ.

104. *Elæocarpus obovatus*, G. Don. Diameter, 12 to 20 in. ; height, 30 to 40 ft.

## LEGUMINOSÆ.

105. *Acacia falcata*, Willd. Diameter, 6 to 12 in. ; height, 20 to 30 ft.  
 106. *Acacia glaucescens*, Willd. Diameter, 12 to 18 in. ; height, 30 to 35 ft.  
 108. *Acacia fasciculifera*, F. Muell. Diameter, 10 to 16 in. ; height, 30 to 40 ft.  
 109. *Acacia salicina*, Lindl. Diameter, 6 to 12 in. ; height, 30 to 40 ft.  
 110. *Acacia harpophylla*, F. Muell. Diameter, 12 to 20 in. ; height, 40 to 70 ft.  
 111. Same as 110 in a younger stage.  
 112. *Acacia excelsa*, Benth. *Brigalow*. Diameter, 20 to 30 in. ; height, 50 to 80 ft.  
 113. *Acacia neriifolia*, A. Cunn. Diameter, 6 to 12 in. ; height, 20 to 30 ft.  
 114. *Acacia doratoxylon*, A. Cunn. Diameter, 6 to 12 in. ; height, 25 to 35 ft.  
 114A. Ditto.  
 115. *Acacia pendula*, A. Cunn. *Weeping Myall*. Diameter, 6 to 12 in. ; height, 20 to 35 ft.  
 116. *Acacia stenophylla*, A. Cunn. *Ironwood*. Diameter, 15 to 24 in. ; height, 40 to 60 ft.  
 116A. Ditto.  
 117. *Acacia leptostachya*, Benth. Diameter, 4 to 10 in. ; height, 20 to 25 ft.  
 118. *Acacia uncinata*, Benth. Diameter, 3 to 5 in. ; height, 6 to 10 ft.  
 119. *Acacia decurrens*, Willd. *Green Wattle*. Diameter, 3 to 8 in. ; height, 30 to 40 ft.  
 119A. Ditto.  
 120. *Acacia amblygona*, A. Cunn. Diameter, 6 to 10 in. ; height, 20 to 25 ft.  
 121. *Acacia decurrens*, Willd., var. *mollis*, Lindl. *Silver Wattle*. Diameter, 6 to 10 in. ; height, 30 to 40 ft.  
 122. *Albizia thozetiana*, F. Muell. Diameter, 12 to 30 in. ; height, 40 to 60 ft.  
 123. *Acacia linifolia*, Willd. Diameter, 3 to 4 in. ; height, 10 to 15 ft.  
 124. *Acacia penninervis*, Sieb. Diameter, 2 to 4 in. ; height, 6 to 12 ft.  
 124A. Ditto.  
 125. *Pithecolobium prunosum*, Benth. Diameter, 5 to 12 in. ; height, 40 to 50 ft.  
 126. *Hovea acutifolia*, A. Cunn. Diameter, 2 to 4 in. ; height, 6 to 10 ft.

127. *Barklya syringifolia*, F. Muell. Diameter, 12 to 18 in.; height, 40 to 60 ft.  
 128. *Cassia Brewsteri*, F. Muell. Diameter, 3 to 6 in.; height, 30 to 50 ft.  
 129. *Jacksonia scoparia*, R. Br. *Dogwood*. Diameter, 3 to 8 in.; height, 10 to 15 ft.

## CORNACEÆ.

130. *Marlea vitiensis*, Benth. *Musk Tree*. Diameter, 6 to 12 in.; height, 20 to 30 ft.  
 130A. Ditto.

## JASMINEÆ.

131. *Olea paniculata*, R. Br. *Native Olive*. Diameter, 18 to 24 in.; height, 50 to 70 ft.  
 132. *Notelæa ovata*, R. Br. *Dunga Vunga*. Diameter, 6 to 12 in.; height, 20 to 30 ft.  
 133. *Notelæa microcarpa*, R. Br. Diameter, 9 to 12 in.; height, 30 to 45 ft.

## LAURINEÆ.

134. *Endiandra pubens*, Meissn. Diameter, 18 to 24 in.; height, 40 to 70 ft.  
 135. *Tetranthera ferruginea*, R. Br. Diameter, 14 to 20 in.; height, 30 to 40 ft.  
 136. *Litsea dealbata*, Nees. Diameter, 18 to 24 in.; height, 40 to 60 feet.  
 136A. Ditto.  
 137. *Cryptocarya patentinervis*, F. Muell. Diameter, 12 to 20 in.; height, 30 to 40 ft.  
 137A. Ditto.

## EBENACEÆ.

138. *Cargillia australis*, R. Br. Diameter, 6 to 12 in.; height, 30 to 40 ft.

## EUPHORBIACEÆ.

139. *Mallotus philippinensis*, F. Muell. Diameter, 6 to 14 in.; height, 30 to 45 ft.  
 140. *Mallotus neophilus*, F. Muell. Diameter, 12 to 18 in.; height, 35 to 45 ft.  
 141. *Croton insularis*, Baill. *Cascarilla*. Diameter, 8 to 12 in.; height, 30 to 40 ft.  
 142. *Croton Verreauxii*, Baill. Diameter, 3 to 5 in.; height, 15 to 20 ft.  
 143. *Petalostigma quadriloculare*, F. Muell. *Crab Tree*. Diameter, 12 to 18 in.; height, 40 to 50 ft.  
 144. *Excæcaria Agallocha*, Linn. *River Poisonous Tree*. Diameter, 6 to 18 in.; height, 20 to 30 ft.  
 145. *Bridelia exaltata*, F. Muell. Diameter, 12 to 18 in.; height, 30 to 45 ft.  
 146. *Bradleya australis*, R. Br. Diameter, 12 to 18 in.; height, 13 to 50 ft.

## MONIMIACEÆ.

147. *Daphnandra micrantha*, Benth. Diameter, 18 to 30 in.; height, 60 to 80 ft.

## SAPOTACEÆ.

148. *Hormogyne cotinifolia*, A. D. C. Diameter, 6 to 9 in.; height, 20 to 35 ft.  
 149. *Chrysophyllum pruniferum*, F. Muell. Diameter, 12 to 30 ins.; height, 30 to 70 ft.

## URTICÆÆ.

150. *Celtis philippinensis*, Blanco. Diameter, 4 to 12 in.; height, 20 to 40 ft.  
 151. *Morus calcar-galli*, Cunn. *Cockspur Thorn*.

## SAXIFRAGEÆ.

152. *Ceratopetalum apetalum*, Don. *Coacwood*. Diameter, 24 to 36 in.; height, 70 to 90 ft.

Sections of forest  
trees exhibited.

## SECTIONS OF FOREST TREES.

Collected in the neighbourhood of Rockhampton, by Mr. P. A. O'Shanesy, and forwarded for exhibition.

## INTRODUCTORY REMARKS.

With the exception of two or three species, the following woods, indigenous to Rockhampton, had not hitherto been exhibited from that place, and were chiefly intended as an illustration of the richness of that district in useful and ornamental timber. In the neighbourhood of Rockhampton alone there are nearly 200 different species of woods available for every purpose from cabinet-work to ship-building, several of which, as the eucalypti or gums, surpass all other known timber in strength and durability; and, as these constitute the main bulk of vegetation in the open forest, the supply is inexhaustible.

## RUTACEÆ.

1s. *Acronychia imperforata*, F. Muell. 10 to 15 ft. 2s. *Acronychia Baueri*, Schott. 20 to 25 ft.

## RUBIACEÆ.

*Randia densiflora*, Benth. A middle-sized tree, with an irregular trunk.  
4s. *Ixora Pavetta*, Roxburgh. 10 to 12 ft. 4A. Ditto.

## BURSERACEÆ.

5s. *Ganophyllum falcatum*, Blume, 30 to 40 ft.

## MYRTACEÆ.

6s. *Eucalyptus melanophloia*, F. Muell. Broad-leaved or silvery *Ironbark*. 25 to 30 ft. 7s. *Eucalyptus crebra*, F. Muell. Narrow-leaved *Ironbark*. An erect tree of 50 to 60 ft., often with a clear trunk of 25 to 30 ft. 8s. *Eucalyptus polyanthemus*, Schauer. Box. 40 to 50 ft. 9s. *Eucalyptus tereticornis*, Sm. Gum. 80 to 100 ft. 9A. Ditto. 10s. *Eucalyptus corymbosa*, Sm. Bloodwood. 11s. *Tristania suaveolens*, Sm. Mahogany and Stringy-bark. 30 to 40 ft. 12s. *Eugenia eucalyptoides*, F. Muell. 15 to 20 ft. 13s. *Backhousia adophora*, F. Muell. 30 to 40 ft. 14s. *Myrtus acmenioides*, F. Muell. Myrtle. 10 to 15 ft.

## EBENACEÆ.

15s. *Maba humilis*, F. Muell. Ebony. 10 or 15 ft. 16s. *Maba fasciculosa*, F. Muell. Ebony. 25 to 30 ft. 17s. *Maba laxiflora* (?), Benth. 15 or 20 ft.

## EUPHORBIACEÆ.

18s. *Mallotus tinctorius*, F. Muell. 19s. *Mallotus elaoxyloides*, J. Mull. 12 to 15 ft. 20s. *Croton insularis*, Baill. 25 to 30 ft. 21s. *Croton acronychioides*, F. Muell. 20 to 25 ft.

## LOGANIACEÆ.

22. *Strychnos pailosperma*, F. Muell. Strychnine.

## CELASTRINEÆ.

23s. *Celastrus dispermus*, F. Muell. 15 to 20 ft. 24s. *Denhamia obscura*, Meissn.

## LEGUMINOSÆ.

25s. *Lonchocarpus Blackii*, Benth. Bloody Bark.

## URTICEÆ.

26s. *Ficus Fraseri*, Miq. Fig Tree. 27s. *Ficus macrophylla*, Desf. Moreton Bay Fig. 28s. *Morus Brunoniana*, Endl. 25 to 30 ft. 29s. *Epicarpurus orientalis*, Blume. 40 to 50 ft.

## SAPINDACEÆ.

30s. *Nephelium divaricatum*, F. Muell. 25 to 30 ft. 31s. *Nephelium connatum*, F. Muell. 35 to 40 ft. 32s. *Nephelium tomentosum*, F. Muell. 33s. *Harpullia Hillii*, F. Muell. *Tulip Wood*. 40 to 50 ft. 34s. *Ehretia membranifolia*, R. Br.

## SANTALACEÆ.

35s. *Santalum lanceolatum*, R. Br. Sandal Wood. 15 to 20 ft.

## CASUARINEÆ.

36s. *Casuarina suberosa*, Willd. Oak. 40 to 50 ft.

## ARALIACEÆ.

378. *Panax elegans*, Moore and Mueller. 30 to 40 ft.

## CORNACEÆ.

388. *Marlea Vitiensis*, Benth.

## SOLANACEÆ.

398. *Solanum verbascifolium*, L. 10 to 12 ft.

Owing to its vast area, and the diversity of its soil, climate, and altitude, there is a greater variety of indigenous trees in Queensland than in the rest of the Australian colonies, and perhaps more than could be found within a similar extent of country in any other part of the world. The specimens of woods exhibited are from a collection that were easily procured, and were chiefly chosen for their economic value. The list, however, does not include one-fourth of the species that have already been described, and there are many which have not yet been classified. Each district of this immense territory is characterised by features in its vegetation peculiar to itself, and years must elapse before all are known and botanically arranged.

It will be for the practical builder, the shipwright, and the cabinet maker, to pronounce an opinion upon the utility of the woods represented in the Court; and it is probable that several of them will have a greater value put upon them in America than they receive in Queensland. It appears inseparable from the state of affairs in a young colony, that very little time or trouble is devoted to experiment, or to the improvement of existing processes. The same woods that the first settlers made use of are still employed, as a matter of course, for the same purposes; and timbers, probably of a superior description, are neglected, or used only as firewood.

The value of some descriptions of the Australian Eucalypti for building or railway purposes, has for some time past been fully recognised; and the number of species is greater in Queensland than in other parts of the continent. The case is the same with other woods, the variety of which is very great, that are remarkable for their strength, durability, fineness of grain, or ornamental appearance.

It is impossible to state, at the present period, the price for which all of the Queensland timbers can be placed in the market, for some of which there is no local demand. The cost, when placed on board ship, will not, however, be great, as most of our valuable woods grow on the coast or the banks of the rivers, or are found within reach of the facilities for transport provided by railway communication.

The following articles made from Queensland wood were exhibited :—

2 Model Rum Hogsheads.

2 Model Tallow Casks.

2 Model Sugar Vats. Exhibitor, Mr. D. Hume, Brisbane.

8 Axe and Pick handles. Exhibitor, Mr. W. Peltigrew, Brisbane.

## Fibres.

## Cl. 666.

## FIBRES.

Near the collection of woods were arranged Samples of Fibre, prepared, from barks of trees of plants indigenous to Queensland, by Alexander Macpherson, Brisbane.

No. 1. *Camersonia echinata*.

„ 2. *Sida retusa*, *Sida rhombifolia*.

„ 3. *Currygong Heterophyllus*.

„ 4. *Ficus Macrophylla*.

„ 5. *Kerandrinia Hookerianana*.

„ 6. *Abutilon oxycarpus*.

„ 7. *Lyonsia reticulata*.

„ 8. *Hibiscus tiliaceus*.

„ 9. *Hibiscus mutabilis*.

„ 10. *Hibiscus rosa sinensis*.

„ 11. *Hibiscus surbifolia*. Exhibited by Alexander Macpherson.

Another collection of Fibres, prepared by Walter Hill, Esq., consisted of -

1. Queensland Hemp (*Sida retusa*).
2. Queensland Hemp (scutched).
3. Queensland Rope (*Sida retusa*).
4. Bowstring Hemp (*Sansevieria cylindrica*).
5. Ceylon Hemp (*Sansevieria Zeylanica*).
6. Guinea Hemp (*Sansevieria Guineensis*).
7. Guinea Hemp (*Sansevieria latifolia*).
8. Mexican Hemp (*Furcraea gigantea*).
9. Pete Hemp (*Agave Americana*).
10. Cuba Hemp (*Furcraea Cubensis*).
11. Jute Hemp (*Corchorus capsularis*).
12. Jute and Pete Hemp (*Corchorus olitorius*).
13. Bengal fibre (*Crotalaria uncea*).
14. Manilla Hemp (*Musa textilis*).
15. Plantain Hemp (*Musa paradisiaca*).
16. Rosella Hemp (*Hibiscus sorbifolia*).
17. (*Hibiscus mutabilis*).
18. Flax (*Linum usitatissimum*).

Collection of Botanical Specimens, full description attached to them.

## Cl. 652.

## LEATHER.

## Leather.

Collection of leather from the Tannery and Curriers' Shops, Ebikin, three miles out of Brisbane, and manufactured from Colonial hides and skins. They are tanned with the bark of the *Acacia* indigenous in Queensland, samples of which can be found in the wall cases of Division II.

2 sides of Black Grained Kip, 12 lbs.; 1 side of Plain Grained Kip, 6 lbs.; 1 side of Tweed Grained Kip, 6 lbs.; 2 sides of Waxed Grained Kip, 12 lbs.; 5 skins of Kangaroo, Waxed, 3 lbs.; 1 skin of Kangaroo, Tweed, 1½ lbs.; 1 skin of Kangaroo Plain Grained, 2 lbs.; 1 skin of Wallaby, Black, ¾ lb.; 1 skin of Wallaby, Waxed, ¾ lb.; 2 skins of Goat, Plain Grained, 1 lb.; 3 skins of Goat, Black, 3 lbs.; 4 Black Grained Basils, 2 Plain Basils; 1 side of Brown Harness Leather, 16 lbs.; 1 side of Black Harness Leather, 27 lbs.; 1 side of Sole Leather, 19 lbs.; 1 side of Kip, Waxed, 8 lbs.; 1 side of Black Grained Kip, 7 lbs.; 1 Calf Skin, Waxed 14½ lbs.; 1 Black Grained Kangaroo, and 1 Flat Grained Kangaroo, 3½ lbs.; 3 Wax Wallaby Skins, 1½ lbs.; 2 Wallaby Skins dressed with fur on.

## Cl. 652.

## FURRED SKINS.

## Furred skins.

1 Kangaroo, 2 ditto, Mauve; 6 Rock Wallaby, 3 Forest Wallaby, 1 Scrub Wallaby, 3 Mauve Wallaby, 1 Blue Wallaby, 1 Fox Wallaby, 5 Wallaroos, 1 Paddy Melon, 3 Seal Skins. Exhibited by T. B. Stephens.

The various Tanneries around Brisbane produce about 450 Hides or 900 Sides of Harness, Sole, and Kip weekly, whilst in 1871-2 they did not turn out more than 200; a number of inland Tanneries have also been started since then.

Kangaroo and Wallaby, especially the latter, can be obtained in great abundance, as the inland districts for 150 miles distant from Brisbane have been fenced in, and as the aboriginals and native dogs disappear, the Wallaby multiply enormously, and are being killed in thousands to save the grass. As the demand for skins, however, is limited, not many of them, however, find their way to the Tanneries.

## MISCELLANEOUS EXHIBITS.

## Miscellaneous.

1 Case of Butterflies, collected in the Cardwell District. Exhibited by G. Butterflies. Richland.

Skull, Tusks, and Teeth of Dugong. Exhibited by John Ching.

4 dozen bottles of Dugong Oil. Exhibited by John Ching.

Dugong Calf in Spirit. Exhibited by John Ching.

Sample of Dugong Oil. Exhibited by Berkley and Taylor.

1 Hunting Saddle, Bridle, Breastplate, Martingale, and Pouch.

1 Trooper's Saddle, and Bridle, complete.

1 Stockman's Saddle and Bridle, complete.

1 Pack Saddle with Harness, complete.

Large Pair of Saddle Bags.

1 Pair of Leggings.

3 Maps of the Colony.

1 Telegraph Circuit.

Dugong oil and specimens.

- 2 Maps of Port Curtis District.
- 1 Geological Map of the Colony.
- 1 Map of Brisbane.
- 1 Map of Wide Bay.
- 2 Maps East and West of Moreton.
- 1 Map of Tin Selections.
- 1 Squatter's Map.

Cl. 306. Books bound at the Government Printing Office :—

- Ornithology of Australia.
- Pugh's Almanac.
- Sugar Cane, by Angus Mackay.
- Semi-tropical Agriculturalist.
- Hocking's Gardener.
- " Floriculture in Queensland.
- Salter's Almanac.
- Maryboro' Almanac.
- Bailey's Ferns.
- 2 Volumes of Newspapers of Queensland to November, containing "Summary" description of each district.
- 500 copies of the "Queensland," with summary.
- 12 copies, Bound Catalogue of Queensland Exhibition, 1875.
- 1 Case of Almanacs, sent by Mr. Willmet, of Townsville, Northern Queensland.

Cl. 430.

PHOTOGRAPHS.

- 12 large sized Views in and about Brisbane.
- Panoramic Views from Wickham Terrace.
- " " Bowen Terrace.
- " " of Ipswich.
- " " Warwick.
- 3 Bells, manufactured by Hopwood and Sutton, from Queensland tin and copper.
- Packet of Castor Oil Seeds, from R. W. Alexander.
- Catalogue of Seeds, by Clarke.
- " " Hockings.

At the extreme ends of the Queensland Court are exhibited :—

- 2 Life-size Photographs of Australian Natives. Exhibitor, Richard Daintree.
- And numerous smaller ones. Exhibited by the Queensland Government.

Number of  
natives insigni-  
ficant.

The Queensland natives are by no means numerous in the unoccupied portions of the country ; in the settled districts they are fast sharing the fate of the American Indian.

RICHARD DAINTREE.

(Contributed to the Catalogue for British Section, Philadelphia, 1876.)

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**SOUTH AUSTRALIA.**

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COMMISSION FROM SOUTH AUSTRALIA TO THE  
PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.

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H. E. SIR ANTHONY MUSGRAVE, K.C.M.G., Governor-in-Chief,  
&c., &c. (President).

HON. WILLIAM EVERARD, M.L.C., Commissioner of Crown Lands and Immigration.	CALEB PEACOCK, Esq., Mayor of Adelaide.
HON. H. E. BRIGHT, M.P., Com- missioner of Public Works.	DR. SCHOMBURGH, Director of the Botanic Gardens.
HON. JOHN CROZIER, M.L.C.	GEORGE M'EWEN, Esq.
WENTWORTH CAVANAGH, Esq., M.P.	JOSEPH CROMPTON, Esq.
R. D. ROSS, Esq., M.P.	F. G. WATERHOUSE, Esq., Curator of Museum.
E. T. SMITH, Esq., M.P.	J. A. HOLDEN, Esq.
E. W. ANDREWS, Esq.	S. V. PISEY, Esq., Vice-President, Chamber of Manufactures.
JOSIAH BOOTHBY, Esq., Under Secretary.	WALTER HACKETT, Esq.
	SAMUEL DAVENPORT, Esq., J.P.
	C. J. COATES, Esq., Hon. Secretary.

Executive Commissioner at Philadelphia.  
SAML. DAVENPORT, Esq., J.P.

Honorary Commissioner at Philadelphia.  
W. A. E. WEST-ERSKINE, Esq.

## SOUTH AUSTRALIA.

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THE name of the Colony of South Australia never exactly fitted her geography, and since a recent reward of her exploring enterprise extended her territory northwards, the divergence has been greatly increased. In a purely topographical sense, she is nearly as much entitled to be called North as South Australia. Preliminary.

Embracing a surface roundly described as 250 miles east and west of a line drawn north and south for 2,000 miles from sea to sea, her area is estimated at 914,730 square miles, or 585,427,200 acres; being about a third of the area of the United States of America, or ten times that of Great Britain. Extent.

On the east, she is bounded by the colonies of Queensland, New South Wales, and Victoria, and on the west by that of West Australia. Boundaries.

A comparison of areas as above is made in order to induce a juster appreciation of Australia. To the eye, distant objects look small, and consequent mental impressions naturally share in the diminutive. Australia is remote from England, and I wish the "mother country," freed from optical illusions, should fully recognise the magnitude of her possessions there. For Empires, as for individuals, there is much in broad acres after all, or I should apologize for intruding a reflection here forced on me by this Philadelphia Exhibition. After crossing from San Francisco to these Eastern States, and seeing what vast resources of wealth in soil and minerals and natural highways for trade the United States possess, and that, with 40,000,000 of people, two-thirds of these States are yet barely occupied, I, as an Englishman, felt a sense of regret that Great Britain ever lost them. It is certain she did not, could not have known what she was losing. She knew, perhaps, in figures to what probable area her American Colonies might expand, but she did not recognise the depths of solid substances involved in the possession of this extra 3,000,000 square miles of the earth's surface. Areas as contrasted between the mother country and offspring.

The Australian Colonies combined, measure a similar area; and who can say but that their united inherent wealth, though differing in character, may not be as great as that of the United States. At least, I venture to think that Englishmen in Great Britain owe it to themselves and to their successors to regard Australia in this light. Australian Colonies equal in extent to the United States.

Of the 914,730 square miles of which South Australia is comprised, the colonists as yet may be said to occupy those portions only which the highway of the ocean has made most accessible. The settlement of inner lands awaits the construction of railways. Still, within her settled limits, she has abundant room for fresh population. Lands that furnish herds of cattle, and of horses, and flocks of sheep, all unsurpassed for quality, productive of the finest wheat, wine, and olive oil, of the pomegranate, the almond, and the fig, from out of whose hills you may dig brass, and over whose surface grow those modern guardians against malarial atmospheres—the eucalypti,—bear witness in themselves of their qualifications for the sustenance and happiness of mankind; and no mean share of such is the occupied portion of South Australia. As to the extent of the powers of the Colony in these directions I am bound here to add that time and experience are essential elements ere their value may justly be determined, even if (as I have ventured to hope) Englishmen would think more of their present and prospective interest in Australia generally. More is needed than the report of an explorer, however intelligent and truthful he may be. Neither the capabilities of the soil nor the nutritious qualities of vegetation are known till tested. What ameliorations of condition may result from climate to the animal or vegetable life we propagate, or what fertilizing powers may rest latent in the soil till consolidated by pasturing, or oxygenated by exposure to the air, are all questions only soluble by experience. General questions as to present conditions and future prospects.

No country has been first unveiled to civilization by more intelligent, intrepid, and truthful men than the occupied portion of South Australia. Her seacoasts by the Lincolnshire Flinders; her chief river and interior by Charles Sturt; her coast ranges and other interior by Governor Eyre. Yet neither Explorers.

Charles Sturt nor the colonists of three years' settlement (from 1836 to 1839) thought the Adelaide plains would grow wheat, and it was only when imported flour had reached 100*l.* a ton, that they made the attempt to grow it. Sturt found the interior a desert to the near sacrifice of his life; so did Eyre, with corresponding bravery and results, and how many of us have subsequently seen the same condition, interchanged for consecutive seasons with such fertility that the desert really waved with vegetation, fattening the sheep and cattle placed upon it rapidly and well. Of some portion of that so-called desert, Hargraves, a gold discoverer of New South Wales, in an official report to the Adelaide Government not many years since, declared it was the finest pastoral country he had seen in Australia; and there he had travelled much.

Personal  
experience.

The need of proofs thus illustrated by experience would, I am sure, be supported by older colonists than myself, though I am of 33 years of country life there, and speak mostly from personal observation. I do not here attempt explanations (the introduction of the question even is, I fear, a trespass), but I may escape under the truthful general assertion that many things are different at the Antipodes. Beyond doubt, the stone of the native cherry grows outside the pulp, a quadruped has the bill of a duck, the native hare has a rat's mouth, and the desert often rejoices, at certain seasons blossoming as the rose; facts, perhaps, sufficiently enforcing the view that Englishmen in Great Britain may suspend their estimate of value until the proofs of experience are established.

Population.  
Live stock.  
Camels and  
mules.

Within the limits of the occupied portion of South Australia the population is 213,271. The live stock consists of 6,120,211 sheep, 185,342 cattle, and 93,122 horses. Camels and mules, which have been introduced successfully by enterprising colonists, might also be mentioned, as they undoubtedly have a future of most useful service in the far interior. About 200,000 square miles are rented from the Government for pasture, whilst private freehold lands, to be bought at an average of 25*s.* per acre, amount to 6,283,881 acres, of which 1,424,000 are cultivated, the last wheat produce of that cultivation being 10,739,834 bushels.

Imports.  
Exports.

The imports of South Australia for 1875 amounted in value to 4,203,802*l.*, of which 2,381,673*l.* were from Great Britain. The exports of 1875 were of the value of 4,805,051*l.*, of which 2,612,817*l.* were to Great Britain. The chief products exported were wool, value 1,885,519*l.*, wheat and flour, value 1,650,661*l.*, and minerals, mostly copper, 762,386*l.*

Revenue.

The revenue of 1875 was 1,143,312*l.*, viz.: Customs 399,104*l.*, Land sales 289,568*l.*, Railways 183,096*l.*, and from other sources 271,544*l.*

Expenditure.

The expenditure of 1875 was 1,176,413*l.*, under the following heads: Public works 460,012*l.*, Interest on bonds 142,476*l.*, Redemption of bonds 34,400*l.*, Immigration 27,140*l.*; other items 512,385*l.*

Public debt.

The public debt on 31st December 1875 was 3,320,000*l.*; in adjustment of which there is a nearly equal amount receivable for lands sold.

Natural wealth.

The natural wealth of the Colony in healthy climate, fruitful soil, and abounding minerals, has been largely augmented by useful and substantial improvements. In addition to numerous ports made serviceable for coasting trade, inland traffic is provided with 884 miles of good macadamised roads, at a cost of over 2,000,000*l.*, and with over 300 miles of railway at a nearly equal sum. The public and private buildings, both in town and country, are mostly of well-built stone, with slate or iron roofs. Gardens, with here and there a vineyard, orchards, pasture and arable fields cover those districts assigned to agriculture, whilst thousands of miles of good "post and wire" sheep-proof fences enclose a great portion of the pastoral districts rented from the Crown, and subdivide them into paddocks of various areas, from 5 to 50 square miles, according to feed and water supply.

Telegraph.

In 1872 South Australia erected 1,973 miles of telegraph wire across her territory, and, at a cost of 350,000*l.*, connected Australia with India and Europe.

Banks.

The assets of six banks, taking an average on the last quarter of 1875, equalled 5,157,868*l.*, their average liability being 3,278,122*l.*, and on the 1st of January 1876, 22,662 persons had the sum of 816,818*l.* deposited in the Government Savings Bank.

Manufactures.

Of manufactures, the Government statist reports "85 steam flour mills in the Province, with 1,500 horse-power driving 275 pairs of stones; 4 meat-preserving establishments; 8 boiling-down works; 60 tanneries and fell-

"mongeries; several large wool-washing works; 10 soap and candle factories; 5 bone-dust mills; 2 glue and size works; 31 steam sawmills; 27 foundries; 86 agricultural implement works (chiefly for reaping and winnowing machines); 29 coach and wagon-builders' shops; 5 patent slips; 8 ship and 12 boat-building yards; several marble, 16 slate, and over 100 building-stone quarries; 70 brickyards (including 6 for firebricks), 60 limekilns, 7 potteries and tile and pipeworks; 8 gasworks (of which two are for the supply of the City of Adelaide and suburbs, one is at Port Adelaide, and the remaining five are in the principal country towns); 1 woollen tweed factory; 6 clothing factories; 4 hat factories; 12 boot and shoe factories; 4 dyeworks; 3 flaxmills; 3 ropewalks; 2 brush manufactories; 29 breweries; 30 sodawater and cordial factories; 102 wine-making establishments; 10 biscuit bakeries; 10 jam and preserves, and 7 confectionery manufactories; 6 dried fruits, and 3 olive oil factories and 1 iceworks. Among other miscellaneous local productions and manufactures are barilla, billiard tables, baking-powder, blacking, cayenne pepper, cement, cigars, fibre, glass bottles, plaster of Paris, washing-machines, sauces and pickles, salt, safety-fuze, gas stoves, iron safes, bedsteads, galvanized iron, and tin-ware."

The government, the laws, and the social institutions, like the people of South Australia, have an Anglo-Saxon character. There is the fullest civil and religious freedom under a Vice-regal Governor, whose ministers are chosen by, and are responsible to, a majority of two Houses of Parliament elected by ballot, as to the larger house, of manhood suffrage alone, and as to the smaller house, by a slightly restricted property qualification. These organizations have worked harmoniously to the contentment of the people. Government.

The means of religious and secular instruction are generally distributed, namely, Government schools (1874) 320, number of children on the rolls 17,426, average attendance 11,969. Government grants for educational purposes voted in 1875: teachers' stipends, &c. 60,000*l.*; building school-houses, 60,000*l.*; maintenance of institutes, 16,000*l.* Also 120,000 acres of land as endowment of public schools, and 50,000 acres endowment of University. Number of churches and chapels in the Colony, 610, of which the following are in the City of Adelaide: 5 Church of England, 3 Congregationalist, 3 Wesleyan Methodist, 2 Baptist, 3 Presbyterians, 3 Primitive Methodist, 1 Bible Christian, 1 Methodist New Connexion, 2 "Christian" denomination, 1 Church of Christ, 1 Lutheran, 1 Society of Friends, 1 New (Jerusalem) Church, 1 Unitarian, 1 Synagogue. The Press of the Colony issues 4 daily, 4 bi-weekly, 14 weekly newspapers, and 11 monthly magazines and other periodicals. Education.

Of Municipal Corporations in the Colony there are 16; of District Councils 90; Hospitals 6; Lunatic Asylums 2; Masonic Lodges 28 with numerous lodges of Oddfellows, Foresters, Druids, Rechabites, and Good Templars. Religions.

The facilities for acquiring real property in the Colony are great, and laws well secure its quiet enjoyment. The public lands are mostly sold on credit; one tenth per cent. is paid down as interest on the purchase money, which is not less than 20*s.* per acre. The balance is deferred to the sixth year, a second ten per cent. on the purchase money having been paid on the third year as interest. At the sixth year half the balance may be renewed for four years at four per cent. if needed; but that the State may secure certain benefit from the sale of its lands under a credit system, the purchaser is bound to effect annual improvements. All metals, precious or other, go to the purchaser. The title to real estate from the Crown is by registration, of which the purchaser gets a certificate in simple form. This system is popular, for it is ready and inexpensive at the outset, and is returnable to the registration office for record on it of all subsequent dealings, or for substituted certificate, or certificate as needed, in the court of sales. At the close of 1874 the value of landed property, which had passed under it, amounted to 9,260,186*l.* Adjoining colonies have adopted this law.\* Municipal and other corporate bodies.

The settled portions of the Colony of South Australia are sectioned off into counties, and these counties, when arable cultivation requires it, are subdivided into hundreds, whose municipal governing bodies can be elected for local public works and education. Outside the hundreds, in the southern portion of the Colony, the public lands are left for purely pastoral occupation, for which 14 or 21 years' leases can be procured at moderate rents, regulated much by Laws for acquiring property.

\* The credit of this measure is due to Sir Robert Richard Torrens, K.C.M.G.

distance from ports of shipment, except that, both as to public lands inside or outside the hundreds, rights to search for and work minerals are readily granted. The rent of a mining lease is fixed at 10s. an acre per annum, and 14 years' term renewable.

In Northern territory.

For the Northern territory of South Australia, with its tropical climate, the land laws are modified. Land there is open for selection and sale at 7s. 6d. per acre, or for lease over ten years at 6d. per acre per annum. And for the special growth of sugar, cotton, tea, rice, and tobacco, selections varying from 320 to 1,280 acres can be made at a rental of 6d. per acre per annum for five years, when, if the land has been enclosed and one half under cultivation, a free grant is procurable.

Sales of land.

The number of acres of land sold in the first year of	
the Colony's existence (1836) was - - -	60,915
By the year 1850, the sum had reached - - -	625,000
And by 1875 - - -	6,283,881

Causes of progress.

The steady and progressive settlement of colonists on the lands of South Australia owes much to the favouring conditions of soil and climate. A small outlay in dwelling-house and fences alone suffices for the farmer to plough, raise, and reap his crop. No barn, no warm stables are necessary to his success. So that fodder is sufficient, his live stock may rove unsheltered throughout the year, not losing condition. Eventually, the farmer has his good store-house, and surrounds it with other comforts of home.

Increase yearly of propertied classes.

The laws also facilitate the acquisition of freehold lands, and are assisted by that national passion to possess land, which characterises the Saxon race; and from these joint causes the labouring classes of the Colony require frequent replenishment to fill up the vacua created by the constant passage of members of their body into the property classes. Their ranks are chiefly recruited by immigration from Great Britain and Ireland, provided for by funds voted by the South Australian Legislature, and disbursed by Mr. F. S. Dutton, C.M.G., the Agent-General for the Colony in London. This year 120,000*l.* is available for free or assisted passages: and a further 100,000*l.* is proposed for the year 1877.

Sundry augmenting causes.

In addition to this Immigration Fund, a special law provides, for persons paying their own passages, that, if eligible, the Emigration Agent may give them Land Warrants, which shall entitle them in the Colony to receive Land Orders of the value of 20*l.* for each adult, and 10*l.* for each child between the ages of 1 to 12, and this Land Order is available as deduction in payment of any land they may purchase. Thus, an emigrant and his wife with 6 children from 1 to 12 years old would receive Land Orders of the value of 100*l.*

And further, under the same law, "any person or persons, shippers, companies, societies or associations desirous of bringing out to South Australia, at his or their own expense, suitable emigrants from Europe, approved by an Emigration Agent, for the purposes of settling on the Crown Lands thereof, and cultivating the same, or for engaging in any Colonial industry, and who shall enter into an agreement with the Commissioner of Crown Lands and Immigration for the conveyance of such emigrants from Europe for the purposes aforesaid, and also enter into a covenant with the said Commissioner that such emigrants shall reside continuously in the said Colony for two years at the least from the date of their arrival, shall be entitled to receive, on the arrival of such suitable emigrants in the said Colony (and, if aliens, after naturalization), a Land Order" of the value of 16*l.* for each adult emigrant, and of 8*l.* for each child from 1 to 12 years old, available in the purchase of land as in the previous case.

This immigration is one of the remaining functions of joint life in action between the Colony and mother country, and is mutually advantageous.

Thereby, the old nation, having started its offspring with outfit and instructions to take root in independent life on its own estate, has the happiness to see her offspring thrive; and the young nation, whose provisions for board and lodging and work are beyond its requirement, invites members of the old family to a share.

Good results of emigration both to "mother country" and colony.

The Colony is benefited by these additional powers of raising increased productions and of constructing fresh means for their distribution and utilization; whilst Great Britain is relieved of surplus population. But "surplus population" means "unutilized forces," not purely mechanical, but of the

joint mechanism of mind and matter found in human structures, and therefore capable of useful work; and to these the colonies give a vent. Still, "unutilized forces" are capital lying idle; indeed their maintenance costs money; thus immigration relieves Great Britain of a burden. Removed to the colonies, these "unutilized forces" come into contact with conditions which arouse their latent energies. Even the voyage has educational effects; and, after the voyage, come the interests, which even the dullest head must in some degree admit, of new scenes, new life or hopeful chances of life, stimulating the better souls at least to new resolves. Work is found: the profits of labour and increased production follow. Thus emigration is a reproductive operation for Great Britain; for by it her surplus populations both find employment and become producers of additional raw material for her manufactures, or for provisioning and clothing her people; whilst, out of the profits of the labour involved, they arise as fresh customers for her goods. And since increased production and customers call forth also increased means of transport and a general expansion of trade, the results of a utilized emigration are of service to Great Britain, and she is, therefore, directly concerned in the peopling and material development of her colonies.

The imports of South Australia for 1875 amounted to 20*l.* per head of her population, and the exports to 24*l.* per head, and about the half of these sums were in the trade with Great Britain. On these data 1,000 emigrants from Great Britain in 1876 would, in 1877, buy 10,000*l.* of British goods; but, as such newly arrived classes would not be average consumers or producers, it may be fairer to halve the amount, and say they buy 5,000*l.* worth only. Still, at this rate, 1,000 emigrants per annum for ten years would pay the mother country 275,000*l.* out of the profits of their "utilized forces."

Imports and exports, 1875, per head.

It is clear, then, the ability of the mother country to supply emigrants, and the means of the Colony to employ them, conduce to the wealth of both. Therefore, in this sense alone, the prosperity of the colonies bears directly and intimately on that of the old country. The more land the colonists cultivate, the more minerals they raise, or materials and food from pasture, the more people they sustain, and the better for Great Britain. By it she enlarges her domain, her national wealth, and the number of her subjects. The Empire by so much is extended as an inheritance for future generations.

Concluding remarks.

Let Great Britain encourage her colonies as integral parts of herself in the production of what their natural powers favour, and their existence being in so many climes, her ability of self supply of all those things she gathers ordinarily from various foreign nations will, in the event of possible adverse action, be found within herself.

The report on South Australia by His Excellency William Robinson, Governor of the Bahamas, dated December 1873, and laid before Parliament in connexion with that of other colonies exhibiting at Vienna, is so full and just in its records to that date: and the work of Mr. Marcus, compiled for the Philadelphian Exhibition,\* has linked facts in detail so effectually to speak for themselves, that I have thought it undesirable and unnecessary to insert any but general statements in this memorandum.

Of the share South Australia took as an exhibitor at the Centennial Philadelphian Exhibition, it may fairly be allowed that her Commissioners could have more amply illustrated her resources, but for the time lost in acquisition of details through long course of post, and for the fallacy, had not a popular opinion intervened, of which similar remoteness from the centre of action delayed the refutation, namely, that the proposed Exhibition partook rather of the nature of a mercantile speculation than the undertaking of a great nation, certain to prove a success.

It is hoped, however, that her exhibit was neither uncomplimentary to the Americans nor discreditable to a British Colony, as she shared with others the greatest courtesies from, and the unbounded hospitalities of, the Americans.

SAMUEL DAVENPORT, J.P.,  
Special Commissioner at Philadelphia.

\* South Australia: its History, Resource, and Productions. Edited by Wm. Marcus. Published by Sampson Low, Morton, Searle, and Livingston, 188, Fleet Street, London, 1876.

**EXHIBITS OF THE COLONY OF SOUTH AUSTRALIA  
at the Philadelphia Centennial Exhibition, 1876.**

P signifies Award for Exhibit.

(The Government of South Australia received also an Award for its Collective Exhibit.)

**DEPARTMENT I.—MINING and METALLURGY.**

Class. 100	Iron ores - - - -	F. Clark and Sons, Adelaide.	
	Bismuth - - - -	Balharnak Mining Company, Adelaide.	
P	Copper ores - - - -	1. North Yelta Mine, near Adelaide 2. Moonta, Wallaroo, and other Mines near Adelaide - - -	} Forwarded from London by the Agent-General, F. L. Dutton, Esq., C.M.G. } From the Burra Burra Mine, near Adelaide. 1st. From the Northern Territory of South Australia.
P	Copper Malachite coated with Azurite Auriferous quartz - - -	} R. S. Crabb, Adelaide - - - South Australian Commissioners, for the following owners, viz.:— T. H. Ayliffe, near Union Mine. T. Becker, Yam Creek. Breese and Starke, Extended Union Mine. Caledonia New Amalgamated Company. Golden Stream Claim. W. K. Griffiths, South Union Mine and Grove Hill Company. J. H. Gunn, Britannia Reef. John Lewis, Pine Creek. Menqhine Bernardo, Pine Creek. New Telegraph Company. Sandy Creek Claim. E. Shepherd, John Bull Reef. Sandy Creek Puddling Company. J. P. Tripp, Lady Alice and Union Reef. Union Prospectors Company. E. H. Whitelaw, Pine Creek. J. S. Westcott and T. Wisen- dunger of the North Union Mine. 2nd. Specimens of Gold Quartz.	
101P	Asphalte, called Coorongite -	Coorong Oil and Coal Company.	
102	Marble - - - - Sandstone - - - - Slate - - - -	South Australian Commissioners - Ditto ditto - 1. Ditto ditto - 2. Ditto ditto -	
			} From St. John's Quarries, Ka- punda, near Adelaide. } From the Mintaro Quarries, near Adelaide. } From the Willunga Quarries, near Adelaide.

**DEPARTMENT II.—MANUFACTURES.**

Class. 201	Olive oil - - - -	1. George L. Barnard, Adelaide	} From fruit of season, July 1875.
P	Olive oil - - - -	2. Sam Davenport, Adelaide	
253	Three silver mounted Emu egg inkstands - - - - One ditto with jewel case - - Four silver mounted Emu egg vases - - - - One silver mounted Emu egg or- nament - - - - Two silver oxydized metal figured piano-candlesticks - - - Australian shell necklace - - Set of opercula brooch and earrings in South Australian gold - - Pair Australian shell earrings in South Australian gold - - Set Australian shell brooch and earrings in South Australian gold - - - - Silver mounted Emu egg inkstand	} Henry Steiner, Adelaide.           J. M. Wendt, Adelaide - - -	} Presented by Commissioners of Australasia to J. H. Cundall, Esq., C.E., Assistant General Superin- tendent.           This was presented by the Com- missioners of Australasia to Col. Sir Herbert Sandford, as repre- senting the British Commission, in recognition of "courtesies re- ceived" during the Exhibition.
253	Iron castings from ore raised near Adelaide. Copper vase, cross and pipe - Silver cup made out of a dollar and a five-franc piece - Teapot made out of a shilling	South Australian Commissioners.  } W. Nitscke, Adelaide.	

## DEPARTMENT III.—EDUCATION and SCIENCE.

Class. 301P	Herbarium, comprising specimens of all the known plants indigenous to South Australia.	South Australian Commissioners - (Award made by Dr. Schomburgh.)	Prepared for exhibition at Philadelphia by Dr. Schomburgh, Director of the Botanic Gardens at Adelaide.
P	Collection of— Birds of South Australia - Mammals of South Australia - Reptilia of South Australia - Skins of Animals of South Australia - Eggs of South Australia -	Adelaide Museum, Adelaide	F. G. Waterhouse, Curator. This collection comprises 108 specimens and 78 species of birds, 15 specimens and 9 species of mammals, and 17 specimens and 13 species of South Australian reptilia.
312	Aboriginal weapons and ornaments - Native bag used by Lubras (women) - String made of human hair - Bark -	J. G. Knight	From the Northern Territory of South Australia.
335	Statistical records and maps relating to South Australia. Photographs descriptive of— Town life in South Australia - Adelaide Botanic Gardens - Adelaide, Suburban views - Farming life in South Australia -  Pastoral life in South Australia -  Mining in South Australia - Northern Territory of South Australia.	South Australian Commissioners -  South Australian Commissioners. South Australian Commissioners, J. H. Angas, John Murray, John Hope, and Saml. Davenport. South Australian Commissioners. G. E. Scott.	Prepared in the office of the Surveyor-General, Mr. G. W. Goyder.

## DEPARTMENT V.—MACHINERY.

Class. 505	Model of improved ore dresser. The slime separator and piston continuous jigger combined. Patented. Jigging machine. Patented	Robert Saunders, Manager of the Burra Burra Copper Mine, near Adelaide.  H. B. Hancock, Moonta Copper Mines, near Adelaide.	Dresses ore at 50% less labour, and saves one third returning charges.  Combined motion, up and down, backwards and forward, making 150 pulsations per minute and dressing 150 tons per diem.
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## DEPARTMENT VI.—AGRICULTURE.

Class. 600	Woods, useful and ornamental, from the neighbourhood of Adelaide.  Woods, useful and ornamental, from the Northern Territory of South Australia. Woods, useful and ornamental, from 200 miles North of Adelaide. Cork, specimen of - - -  Barks, valuable, for Tanning: 1. Ground Mimosa (Black Wattle) - - - 2. Ground Acacia - - - 3. Chopped Mimosa (Black Wattle) - - -	South Australian Commissioners, Adelaide.  South Australian Commissioners  Saml. Davenport, Adelaide - -  Arthur Hardy, Mount Lofty, near Adelaide.  H. Wilke and Co., Port Adelaide	Of these, 19 polished and 13 unpolished specimens were supplied by Mr. H. C. Mair, Engineer-in-Chief, Adelaide. Forwarded by Mr. J. B. Scott, Government Resident, Northern Territory. One of these woods (the Myall) distilled, produces valuable scent. Tree from acorn imported from Spain, 1864.  London Agents, D. & W. Murray, 16, Housell Street.
604	Fungi - - - - -	South Australian Commissioners -	Supplied by W. B. Hughes, Northern Territory of South Australia.
605	Red Berries (seeds of the Creeping Liquorice), called by the natives Mancoi Mancoi - - - Cork-screw Pine seeds - - -	South Australian Commissioners	From J. E. Kelsey and W. B. Hughes, Northern Territory of South Australia.

DEPARTMENT VI.—AGRICULTURE—*continued.*

Class.			
610P	Wax Models of Fruit, taken from originals grown in South Australia.	South Australian Commissioners, Adelaide.	
620	Wheat - - - season 1874	Thomas Carling, Adelaide.	
	Wheat - - - " 1874	John Biggs, Adelaide.	
	Wheat - - - " 1875	John Biggs, Adelaide.	
	Wheat - - - " 1876	C. B. Young.	
	Wheat, Nonpareil - " 1874		
	Wheat, PurpleStraw - " "		
	Wheat, " C.B.F. - " "		
	Wheat, Red Straw - " "		
	Wheat, Frame hybrid - " "		
	Wheat, Red Lammas - " "		
	Wheat, Tuscan - " "		
	Barley - - - " "		
	Barley, Cape - - - " "		
	Barley, Skinless - - - " "		
P	Oats, White - - - " "	South Australian Commissioners	Collection of cereals. Field and garden seeds.
	Oats, Cape - - - " "		
	Rye - - - " "		
	Peas, Field - - - " "		
	Peas, Garden - - - " "		
	Linseed - - - " "		
	Hemp seed - - - " "		
	Cape seed - - - " "		
	Sunflower seed - - - " "		
	Prairie-grass seed - - - " "		
	Rib-grass seed - - - " "		
	Holcus - - - " "		
623	Hops, grown at Mount Gambier, near Adelaide.	J. E. Kelsey, Mount Gambier, Adelaide.	From volcanic soil.
644	Trepang, cured at the Fishery, Port Essington, in the Northern Territory of South Australia.	South Australian Commissioners -	From Robert Cardwell, Port Essington, Northern Territory.
652P	Sheepskin Mats, 12 - - -	W. Kemp, Adelaide.	
	Sheepskin, of pure Lincoln Ram-lamb, aged 9 months - - -	J. H. Angas, of Collingrove, near Adelaide. The breeder.	
	Sheepskin, of pure Lincoln Ewe, 9 months' growth of wool - -	J. H. Angas.	
	Skins of the Spotted Emu - -		
	Skins of animals indigenous to South Australia, made up in designs - - -		
	Skins of Kangaroo and Wallaby, &c., dressed - - -	South Australian Commissioners.	
	Skins of indigenous animals, manufactured - - -		
	Skins of indigenous birds and animals of South Australia, made into muffs, collarettes, &c.		
	Skins of native animals and birds	Saml. Davenport, Adelaide.	
653	Emu eggs - - - - -	South Australian Commissioners.	
	Emu eggs - - - - -	Saml. Davenport.	
	Emu eggs, made up in imitation of jewellery.	Saml. Davenport.	
656P	Meat, Dry extract of, in 1 oz., 2 oz., 4lb., 1lb., and 1lb. packets.	E. M. Bagot, of Adelaide - -	London Agents are Atkins & Co., 6, St. Helen's Place.
P	Raisins, Sultanias - - -	Thomas Hardy, Adelaide.	
	Raisins, Muscatel, in layers - -		
	Raisins, Muscatel, loose - - -		
	Zante Currants - - - - -		
	Raisins, Sultanias - - - - -		
	Raisins, Malaga - - - - -		
	Raisins, Muscatel, in layers - -		
	Raisins, Muscatel, loose - - -	South Australian Commissioners.	
	Zante Currants - - - - -		
	Plums, Dried - - - - -		
	Plums, Blue-rose - - - - -		
	Figs, Dried - - - - -		
P	Fruits, Dried - - - - -	Wurm, Frederick, Adelaide.	
	Jams, Collection of - - - - -	Alexander Murray, near Adelaide.	
P	Jams, Assorted - - - - -	George M'Ewen, near Adelaide.	
	Jellies and Marmalade, Collection of.	Alexander Murray, near Adelaide.	
657	Flour, from wheat of 1874 - - -	John Dunn & Co., Adelaide.	
	Flour, from wheat of 1874 - - -	Thos. Magarey & Co., Adelaide.	
	Flour, from wheat of 1874 - - -	Thos. Cowan & Co., near Adelaide.	

## DEPARTMENT VI.—AGRICULTURE—continued.

Class. 660	Wines:—		Variety of Grape.	Soil, Aspect, Elevation, &c.
	Section A.			
	LIGHT WHITE WINES.			
1.	Riesling -	Vintage 1865	Riesling.	
2.	Verdelho -	1864	Verdelho -	Gravelly soil.
3.	Morialta Sweetwater -	1865	Sweetwater -	Gravelly; 2000 feet over level of sea.
4.	Riesling -	1870	Riesling -	Shale soil.
5.	Palomino Blanco -	1869	Palomino Blanco -	Red clay with calcareous subsoil.
6.	Morialta Sweetwater -	1870	Sweetwater -	Gravelly soil; 2000 feet over sea level.
7.	Temprana -	1867	Temprana.	
8.	Doradilla -	1867	Doradilla.	
9.	Frontignac -	1868	Frontignac.	
10.	Old Spanish -	1864		
11.	Sweetwater -	1872	Sweetwater.	
12.	Moorooroo Riesling -	1873	Riesling -	Calcareous loam.
13.	Pewsey Vale Riesling -	1868	Riesling -	Sandy and gravelly; 1500 feet above sea.
14.	Pewsey Vale Riesling -	1869	Riesling -	Do. do.
15.	Sweetwater -	Vintage 1865	Sweetwater.	
16.	Riesling -	1871	Riesling.	
17.	Grenache -	1871	Grenache -	
18.	Grenache -	1870	Grenache -	
19.	White Spanish -	1870		
20.	Dry Hock -	1869	Sweetwater and Verdelho.	
21.	Highercombe Amber -	1871		
22.	Do. -	1870	Verdelho, Riesling, and Spanish -	Loam with ironstone; 1300 feet above sea.
23.	Do. -	1870		
24.	Do. -	1869		
25.	Verdelho -	Vintage 1871	Verdelho -	Sandy clay; hilly.
26.	Auldans, White -	1873	Verdelho, Tokay, and Palomino Blanco.	Ironstone, calcareous and decayed slate soil; 600 feet above sea, and north aspect.
27.	Chasselas -	1873	Chasselas -	Loamy.
28.	Palomino Blanco -	1867	Palomino Blanco.	
29.	Doradilla -	1867	Doradilla.	
30.	Doradilla -	1869	Doradilla -	
31.	Pedro Ximenes -	1871	Pedro Ximenes -	
32.	Morialta, White -	1870		
33.	Do. -	1872		
34.	Do. -	1873		
	Section B.			
	FULL-BODIED WHITE WINES.			
1.	Morialta, White -	Vintage 1866	Madeira & Sweetwater.	
2.	Do. -	1867	Madeira.	
3.	Riesling -	1870	Riesling.	
4.	South Australian Sherry -	1868	Sherry Grape.	
5.	Frontignac -	1870	Frontignac -	Shale, gravelly.
6.	Pineau -	1871	Pineau.	
7.	Shiraz -	1871	Shiraz.	
8.	Moorooroo Verdelho -	1869	Verdelho -	Calcareous loam.
9.	Mixed White -	1869		
10.	Frontignac -	1869	Frontignac -	
11.	Frontignac -	1871	Frontignac -	
12.	Madeira -	1869	Madeira -	
13.	White Auldans, No. 18. }	1874		
14.	Do., No. 9. -	1873	Palomino Blanco, Tokay, Verdelho, & Pedro Ximenes.	Calcareous ironstone & decayed slate; 600 feet over sea; N. aspect.
15.	Larac, No. 1. -	1866	Riesling, Verdelho, and Palomino Blanco.	
16.	Do., No. 2. -	1864	Madeira.	
17.	Grenache and Verdelho -	1872	Pedro Ximenes & Muscat.	
18.	Riesling -	1865	Grenache & Verdelho.	Loamy; aspect N.E.
19.	Do. -	1869	Riesling.	
20.	Do. -	1871	Do.	
21.	Riesling -	1871	Do.	
22.	Oomoo, White -	1871	Riesling -	Calcareous loam; hilly.
23.	Verdelho -	1870		
24.	Gouais -	1871	Pedro Ximenes, &c.	
25.	Colonial Sherry -	1869	Verdelho -	Loamy soil.
			Gouais -	Do.

## DEPARTMENT VI.—AGRICULTURE—continued.

Class. 660 cont.	Section C. LIGHT RED WINES.		Variety of Grape.	Soil, Aspect, Elevation, &c.
	1. Monalta, Red - Vintage 1865	South Australian Com- missioners, Adelaide -	—	Ferruginous clay with calcareous subsoil.
	2. South Austra- lian Claret - } " 1870		Carbonet & Rous- sillon.	
	3. Do., No. 1. " 1870		Roussillon.	
	4. Monalta, Red - " 1867		—	
	5. Shiraz - - " 1872		Shiraz - - -	
	6. Do. - - " 1867	Joseph Gilbert, Pewsey Vale, Adelaide - -	Shiraz - - -	Sandy and gravelly soil; 1650 feet above sea.
	7. Pewsey Vale } " 1869		Carbonet & Shiraz	
	8. Carbonet - } " 1868		Carbonet & Sau- vignon.	
	9. Highercombe } " 1867	R.D. Ross, Highercombe, Adelaide - -	Shiraz, Malbec, & Carbonet in com- bination.	Calcareous limestone: 600 feet above sea; aspect N.
	10. Ruby - - " 1869		—	
	11. Do. - - " 1870		—	
	12. Do. - - " 1871	Patrick Auld, Magill, Adelaide.	Shiraz, Malbec, & Carbonet, and Shiraz.	
	13. Auldana Ruby- " 1873		Pomade.	
	14. Pomade - - " 1870	George White, Rosefield, Adelaide.	—	
	Section D. FULL-BODIED RED WINES.			
	1. South Austra- lian Port - } Vintage 1868	South Australian Com- missioners, Adelaide -	Black Portugal & Shiraz.	
	2. Shiraz - - " 1872		Shiraz & Malbec.	
	3. Mataro - - " 1873	J. D. Holbrook, Adelaide	Mataro.	
	4. Red Hermitage " 1870		Red Hermitage & Shiraz.	
	5. Hermitage - - " 1873	Dr. Kelly, Tintara, Ade- laide - -	Shiraz, Malbec, & Mataro.	Ferruginous gravel.
	6. Burgundy - - " 1873		Shiraz, Carbonet, and Mataro.	
	7. Claret - - " 1873	John H. Kaines, Ade- laide - -	Carbonet & Mataro.	
	8. Shiraz - - " 1871		Shiraz & Carbonet.	
	9. Do. - - " 1869	Clark and Crompton, Adelaide.	Shiraz.	800 feet above sea level.
	10. Carignan - - " 1867		Carignan - - -	
	11. Shiraz - - " 1870	W. Salter and Son, Salt- ram, Adelaide.	Shiraz - - -	Sandy soil.
	12. Oomoo, Red - " 1872	Thomas Hardy, Adelaide	Shiraz, Malbec, &c.	Red and brown loam on calcareous ironstone; 500 feet above sea.
	13. Beaumont deuxieme crû 1868	Saml. Davenport, Beau- mont, Adelaide -	Shiraz - - -	
	14. Do., troisieme crû 1868		Belos Blanco and Shiraz.	
	15. Claret - - Vintage 1868	H. C. Quick, Marden, Adelaide - -	Shiraz & Carbonet. Do.	
	16. Do. - - " 1870		Quick's Seedling.	
	17. Larac, Red - - " 1869	Isabella Baker, Morialta, Adelaide.	- - -	Red loam.
	18. Morialta, Red - " 1871		- - -	
	19. Do. - - " 1871	G. F. Ind, Paradise, Ade- laide.	Shiraz and Mataro	Sandy loam; N.E. aspect.
	20. Do. - - " 1870		Mataro.	
	21. Shiraz - - " 1872	James Martin Gawler, Adelaide.	Shiraz - - -	Calcareous soil.
	22. Mataro, Red - -	J. W. Rickman, Water- vale, S.A. - -	Grenache - - -	
	23. Shiraz - - " 1870	C. B. Young, Adelaide -	Shiraz and Mataro	Sandy loam on marly subsoil; aspect E.; 250 feet over sea level.
	24. Grenache - - " 1870		Shiraz.	
	25. Kanmantoo - - " 1870	Joseph Gillard, Adelaide -	Espanoir, Malbec, Carbonet, and Shiraz.	Sandy loam.
	26. Do. - - " 1871		Malbec and Por- tugal.	
	27. Shiraz - - " 1868-9	Patrick Auld, Magill, Ade- laide.	—	
	28. Auldana Ruby- " 1874		—	
	29. Malbec - - " 1872	Geo. L. Barnard, Adelaide	—	

## DEPARTMENT VI.—AGRICULTURE—continued.

Class. 660 cont.	Section E. SWEET AND LIQUEUR WINES.		Variety of Grape.	Soil, Aspect, Elevation, &c.		
	1. Verdelho - Vintage 1870 2. Old Constantia " 1866	South Australian Com- missioners, Adelaide -	Verdelho - - Constantia and Shiraz. Muscat. Muscat.	Calcareous loam.		
	3. Muscat - - " 1868 4. Do. - - " 1868 5. Liqueur - - " 1868 6. Chateau Beau- mont - - } " 1869		Saml. Davenport, Beau- mont, Adelaide.		Grenache, Mataro, and Scyras.	Red and brown loam on limestone; aspect N.W.; 500 feet over sea level. 600 feet over sea level.
	7. Sweet Auldana " 1873		Patrick Auld, Magill, Ade- laide.		Royal Muscadine and Frontignac.	
	8. Pedro Ximenes " 1872 9. Do. - - " 1871 10. Muscat - - " 1869		Edward Thornber, Un- ley, Adelaide.		Pedro Ximenes -	
	11. Moorooroo Ver- delho - - } " 1872 12. Moorooroo Fron- tignac - - } " 1871	Thomas Hardy, Adelaide -	Muscatel & Gordo Blanco. Verdelho - - Frontignac - -	Calcareous soil.		
	13. Muscatel - - " 1873 14. Do. - - " 1873 15. Madeira - - " 1868 & 1870	E. W. Wright, Home Park, Adelaide { Joseph Gillard, Adelaide -	Muscatel - - Muscatel - - Madeira.		{ Argillaceous, ferru- ginous, and calcareous; aspect W.	
The following exhibitors received Awards for Wine :						
	<ul style="list-style-type: none"><li>Commissioners for South Australia.</li><li>Samuel Davenport, Resident Commissioner.</li><li>Joseph Gilbert.</li><li>Thomas Hardy.</li><li>Dr. Kelly.</li><li>G. F. Ind.</li><li>Edward Thornber.</li><li>J. D. Holbrook.</li><li>George White.</li><li>R. D. Ross.</li></ul>		<ul style="list-style-type: none"><li>J. W. Richman.</li><li>Joseph Gillard.</li><li>John H. Kaines.</li><li>Patrick Auld.</li><li>Henry Foote.</li><li>E. W. Wright.</li><li>C. A. Hornabrook.</li><li>Isabella Baker.</li><li>Salter, W., and Son.</li></ul>			
660	Stomach bitters - - - - Quinine Wine - - - - Doctors' Bitters - - - - Lime Juice Cordial - - - - Collection of Bitters - - - - Collection of Cordials - - - - Collection of Liqueurs - - - -	{ A. M. Bickford & Sons, Adelaide.  F. C. Davis, Adelaide. F. C. Davis, Adelaide. W. Nitschke, Adelaide.				
667P	Wool, Combing, Merino, greasy -		Joseph Keynes, of Keyneton, Adelaide.			
P	Wool, Combing, Merino Ram -		John Murray, of Murrayvale, Adelaide.			
	Wool, Lincoln and Leicester Cross Wool, Lincoln and Merino Cross - Wool, Merino Combing, greasy -		Thomas Graham, Adelaide. W. J. Browne, Moorak, Adelaide. Hayward, Armstrong, & Co., Wonoka, Adelaide.			
P	Wool, Merino - - - -	Price and Browne, Wilpena, Ade- laide.		English Agent, J. F. Hayward, Freshford, Bath.		
P	Wool - - - -	W. Crozier, Overland Station, River Murray, Adelaide.		English Agent, W. J. Browne, Merly House, Dorsetshire.		
	Wool - - - -	Joseph Keynes, of Keyneton, Adelaide.		{ London Agent, Atkins & Co., 6, St. Helen's Place.		
P	Wool - - - -	Allan McFarlane, Wellington Lodge, Adelaide.				
P	Wool - - - - Wool, Lincoln, greasy - - - - Wool, Merino scoured Hwe - - - - Wool, Cross-bred Lincoln, scoured - - - - Wool, Merino Lambs, scoured - - - - Wool, Specimens of greasy - - - -	{ J. H. Angas, of Collingrove, Adelaide.		London Agent, Edenbrough, Doxat, & Co.		
668P	Silk, 4 hanks, and Silk Cocoons -		Frederick Wurm, Adelaide.			
672	Reaping Machine (known as Ridley's Stripper).		South Australian Commissioners, Adelaide.			
681	Guano - - - -		W. F. Dalwood, Adelaide			From Browae Island, off West Coast of Australia.

NOTE.—Some of the Exhibits, specially the samples of Flour and Wheat, samples of Wool, and portions of Bagot's Extract of Meat, had suffered damage from salt water on board the "Skerryvore," importing them. The best of some of these were too much destroyed to be exhibited.

SAM. DAVENPORT.

## MANUFACTURES OF SOUTH AUSTRALIA.

Description.	Number.
Agricultural Implement Works	86
Biscuit bakeries	10
Boat-building yards	12
Boiling-down works	8
Bone-dust mills	5
Boot and Shoe factories	12
Breweries	29
Brick-yards, including 6 Fire-brick yards	70
Brush factories	2
Coach and Wagon factories	29
Confectionery works	7
Clothing factories	6
Drying fruit factories	6
Dye-works	4
Flax mills	3
Flour mills, Steam	85
Foundries	27
Gasworks	8
Glue and Size works	2
Hat factories	4
Ice works	1
Jam and Fruit preserves	10
Lime-kilns	60
Meat preserving establishments	4
Olive oil factories	3
Patent Slips	5
Potteries, Tile and Pipe works	7
Quarries, 16 Slate ; over 100 Building-stone ; Marble, several	130, say
Rope-walks	3
Soda-water and Cordial factories	30
Ship-building yards	8
Soap and Candle works	10
Steam Saw-mills	31
Tanneries and Fellmongeries	60
Wine-making establishments	102
Woollen Tweed factories	1
Wool-washing works	numerous.

Other local manufactures are : Barilla, Baking powder, Billiard tables, Bedsteads, Blacking ; Cayenne pepper, Cement, Cigars ; Gas stoves, Galvanized Iron and Tin ware, Glass bottles ; Iron safes ; Plaster of Paris ; Saddlery, Safety fuzes, Salt, Sauces and Pickles ; Washing machines.

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TASMANIA.

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**COMMISSION FROM TASMANIA TO THE INTERNATIONAL  
EXHIBITION, PHILADELPHIA, 1876.**

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**H. P. WELSH, Esq., Resident Representative  
Commissioner.**

**P. A. JENNINGS, Esq., Resident Commissioner.**

## TASMANIA.

<p>"TASMANIA, the recognised sanatorium of Australia, was undoubtedly formed by nature in her kindest mood. The whole island is replete with natural beauties. Mountains frown in majesty on peaceful valleys and extensive plains, framed as it were by sinuous rivers, the banks of which form a fit theme for the pen of the poet or the pencil of the artist. The prosperity which marked the progress of the colony in the year 1873 still continues, and the first half of the year 1876 will bear favourable comparison with the improvement in the condition of the colony which caused such general satisfaction at the date of the Intercolonial Exhibition. On the 7th February 1870 the population, according to the census then taken, numbered 99,328 souls, of whom 52,853 were males, and 46,475 were females. The estimated population on the 31st December 1875 was 103,663, the number of males being 54,643, and the number of females 49,020. The revenue* for the year 1875 was 343,676<i>l.</i>, and the expenditure †385,731<i>l.</i> The value of imports in the same year was 1,185,942<i>l.</i>, while that of exports was 1,085,976<i>l.</i></p> <p>"Education is compulsory, and of a most comprehensive character; there is scarcely any remote district in which there is no school, and no loophole is allowed to the careless parent to permit him to let his children drift into ignorance. Numerous industries have been established, and those who were once content to observe the wool growing on the sheep's back are astonished at seeing how rapidly and beautifully the Hobart Town and Launceston mills convert the raw material into articles of luxury as well as of domestic consumption.</p> <p>"The total area of the island of Tasmania is 16,778,000 acres, of which 4,024,808 acres are alienated from the Crown by grant and sale; 1,463,923 acres are held under depasturing licenses from the Crown. The total area under cultivation in the colony is 332,782 acres. Wheat takes first rank in extent and importance, 42,745 acres being allotted to this cereal; barley, 5,939 acres; oats, 32,556 acres. Consequent on the high duties enforced on agricultural produce by the other Australian Colonies, and the fluctuating state of the inter-colonial markets, the attention of Tasmanian agriculturists has of late years been turned to the production of wheat for the English market, and this has become the most important article of strictly agricultural produce. The export of grain in the year 1875 was valued at 109,637<i>l.</i></p> <p>"Salubrity and comparative coldness of climate, owing to higher latitude, make Tasmania an excellent breeding station of stud stock for all the Australian continent, especially as regards animals whose features of excellence consist in that massiveness of form of muscular development, in the dewy mellowness of skin, and that hardy constitution so requisite in the ox, the sheep bred for killing in contradistinction to that reared for wool, and the draught horse. The number of horses in Tasmania in 1875 was 23,473, cattle 118,694, and sheep 1,719,768. The bulk of the wool produced is Merino. The export of wool during the year 1875 amounted to 6,199,248 lbs., which represented a value in the Colony of 433,550<i>l.</i></p> <p>"The mining industry for many years past was confined to gold and coal, but during the past year tin, iron, and slate have attracted much attention. The yield of gold for the last twelve months was—alluvial, 270 ozs.; quartz, 2,740 ozs. The quantity of quartz crushed was 3,889 tons. The average yield per ton of stone was 14 dwts. 2 grs. The average value of gold per ounce was 4<i>l.</i> for alluvial; quartz, 3<i>l.</i> 19<i>s.</i> 6<i>d.</i> The total value of the produce of gold for 1875 was 11,982<i>l.</i> Since the beginning of 1876 a great revival in gold mining has taken place, the reefs at Nine Mile Springs having been proved to be of singular richness. The yield of gold in the present year will exceed that of any former year.</p>	<p>Introductory.</p> <p>Progress of colony.</p> <p>Census in 1870.</p> <p>Census in 1875. Revenue, 1875. Imports and Exports, 1875.</p> <p>Education.</p> <p>Home manufactures.</p> <p>Total area.</p> <p>Area under cultivation.</p> <p>Inter-colonial duties on agricultural produce.</p> <p>Export of grain.</p> <p>Suitability of colony for breeding purposes.</p> <p>Export of wool in 1875.</p> <p>Mining industry: Gold, tin, iron, coal, and slate.</p>
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\* Not including moneys raised by loan.

† Including 52,000*l.* for repayment of loans.

- Tin deposits.** "The mineral which occupied the greatest share of attention in that year was tin; the supply of ore being practically unlimited—the character at the deposits at Mount Bischoff admitting of no question. The total amount of tin raised in 1875 was 607 tons, the quantity in 1876 will be greatly multiplied. Silver has been proved to exist at Penguin Creek, but is not at present worked. With respect to iron, the quantity raised during the year is set down as 3,200 tons, and 510 tons of manufactured iron were exported. Extensive works were completed and opened at the middle of the year, and the production of this metal will thus be very largely increased.
- Silver.**
- Iron.**
- Bismuth and antimony.** "Bismuth is also known to exist in the Colony, as well as antimony.
- Coal measures.** "The island of Tasmania is intersected by many valuable coal measures. At present the output of Tasmanian coal is not extensive, and the island is mainly supplied from Newcastle, New South Wales, although, for domestic purposes, Tasmanian coal is used to a considerable extent.
- Slate deposits.** "During the past two years attention has been directed to the slate deposits of Tasmania; the high prices ruling for English slates in the colonial markets has induced the Australian Slate Company to commence work on a fair scale. The Tasmanian slates are said to be superior to the English.
- White clay.** "At Ilfracombe Bay there is an extensive bed of pure white clay which seems very refractory, and which, when mixed with fine quartz (also abundant and close at hand) forms an admirable fire brick. Common clays are found in all directions, and the iron companies are now manufacturing bricks.
- Brick clay.**
- Kaolin or porcelain clay.** Kaolin or porcelain clay is also found at Circular Head.
- Limestone.** "In the West Tamar district, as also in numerous other places, limestone quarries have been worked for many years past. There is an immense mountain of blue limestone, situated about two miles from the township of Latrobe, on the River Mersey. At the River Don there are very large deposits of pure carbonate of lime, and the eastern districts, especially Fingal, abound with lime of various kinds and qualities.
- Timber trees.** "The principal timber trees of Tasmania,—such as blue gum, stringy bark, white gum, or gum-topped stringy bark, swamp gum, and peppermint tree,—furnish a hard, close-grained, and strong timber. Huon pine is very durable, and is employed for boat-building and for house-fittings, &c. Blackwood makes excellent billiard tables and furniture, naves and spokes, cask staves, &c. Myrtle is valuable for house-fittings. Swamp gum yields the finest palings and other split-stuff in the world. Sassafras affords timber for house-fittings, bench screws, &c. Celery-topped pine is chiefly used for masts and ships' spars. In addition to these, silver wattle is used for wood staves and treenails. Mallets, sheaves of blocks, and turnery are manufactured from iron wood, while the native cherry is used for tool handles, gun stocks, &c. White wood is a fit wood for engraving purposes, while pink wood and native pear are suitable for turnery. Tonga bean wood and native box have both a pleasant odour, that of the latter being fleeting.
- Tanning bark.** "Bark is largely exported to England and New Zealand for tanning purposes. The price of ground bark varies from 4*l.* to 6*l.* per ton at the ports. During the year 1875, 6,507 tons were exported, valued at 40,542*l.* Hops also are largely cultivated. In 1875, 767,444 pounds weight were exported, valued at 55,149*l.*
- Wild animals.** "The principal animals are the kangaroo, wallaby, opossums, and bandicoots, the skins of which are all of avail for tanning purposes, the fur being highly valuable for rugs, &c. The devil and Tasmanian tiger are formidable beasts to sheep, and used to make great havoc amongst the flocks. The tiger is a low long-bodied animal, with powerful forequarters, and a dog-like head, weighing sometimes from 60 lbs. to 70 lbs. The devil, though not so large, is more hideous in appearance than the tiger.
- Birds.** "Of birds, 171 species have been observed, but of these only 20 species are supposed to be peculiar to Tasmania. The notes of many of the birds are very musical, the most remarkable being the reed warbler, the tones of which approach those of the nightingale, the black and white magpie, and the butcher bird. The principal edible birds are varieties of quail, duck, snipe, golden plover, and pigeons.
- Fresh water fish.** "There are many species of fresh water fish, the most valuable being the cucumber grayling. Amongst the estuary fish, those most appreciated as edible are the sole, whiting, gar-fish, and rock-cod. The best of the deep

sea fish are the trumpeter and king-fish. During the last ten years the salmon trout and brown trout, the tench and perch, have been established in many of the rivers and lakes. Salmon and salmon trout have been successfully acclimatised. Many of the rivers are now well stocked with the brown trout, which are found to thrive remarkably well, and grow to a large size.

"The chief industries are brewing, milling, jam making, fellmongering, tanning, and coopering. Most of the beer is excellent, and is fully appreciated in the other colonies. The quantity of jam exported in the year 1875 was 2,851,830 lbs., and 159,224 bushels of fruit, valued together at 116,576*l*. Tasmanian leather is excellent, all varieties from kip to kangaroo being supplied of such quality that a great falling-off in the importation of inferior leather from European ports has taken place; and in 1875, 21,937*l*. worth was exported.

"The exhibits from Tasmania will be found interesting in elucidating the natural resources and industrial progress of the colony." (*Extracted from the Official Report of the Victoria Exhibition, 1875.*)

There is one remarkable feature distinguishing Tasmania from all other countries, whose statistics have been compared with hers, which ought not to be passed by unnoticed, namely,—the small mortality among children, particularly those under one year of age. Taking an average of five years the following results have been arrived at. Out of 100 infants born, there died within the first year in Tasmania, 9·45; in New South Wales, 9·57; in Queensland, 11·07; in Victoria, 11·86; in South Australia, 14·24; the number in England being about 16; in Scotland about 12½. The percentage of deaths of children under five years to the total deaths was—Tasmania, 28·08; New South Wales, 42·14; Victoria, 45·50; Queensland, 46·33; South Australia, 54·17. The proportion of children under five who died to 1,000 children of the same age living was—in Victoria (10 years), about 52½; in England and Wales (30 years), about 67½; in Tasmania less than 27. Thus it appears that the mortality of children under five years of age in Tasmania is little more than half that of the least healthy of the Australian Colonies. It is also considerably under that of New Zealand, which, as regards the general death rate, is the most healthy of all the Australian group.—(*Nowell, Statistician.*)

With regard to Tasmanian timber, it may be remarked that by some of the most experienced local shipbuilders the Tasmanian blue gum is classed next to teak for shipbuilding, oak being regarded as only third in value. The indigenous wood known as Huon pine is stated to be superior to elm for boat building, since it bends equally well, and does not break when old.

From a series of experiments made by Mr. James Melville Balfour, C.E., Provincial Marine Engineer of Otago, on specimens of the Tasmanian blue gum, the following mean results were obtained:—

Specific gravity	-	-	-	1·014
Weight of a cubic foot, lbs.	-	-	-	63·19
Elasticity	-	-	-	312
Greatest deflection in inches, elasticity remaining uninjured	-	-	-	·48
Greatest weight carried with unimpaired elasticity, lbs.	-	-	-	141
Ultimate strength, lbs.	-	-	-	269
Deflection at instant of fracture, inches	-	-	-	2·36
Breaking weight at centre of a beam, 20 feet clear space (supported at ends), reduced to a uniform weight of 20 lbs. per lineal foot, and of the proportions, depth equal to twice breadth, tons	-	-	-	11·066

The above figures are taken from Appendix C. to the Report of the Commissioners for the New Zealand Exhibition of 1865. The same report also contains the following remarks:—"The collection of Tasmanian timbers exhibited is both interesting and extensive, and certainly proves the right of that colony to rank very high among the timber-producing countries of the world. The specimens exhibited may be assumed fairly to represent the peculiar qualities of Tasmanian woods, which are probably as a whole inferior to none in density, toughness, and remarkable durability, as well as the ornamental varieties in striking beauty." (p. 137).

Acclimatisation of salmon (salmo salar), salmon trout, and brown trout.

Chief industries.

Resources and industries shown in exhibits.

Noteworthy feature in Tasmania. Small infant mortality.

Shipbuilding wood.

Analysis of Tasmanian blue gum.

Opinion of New Zealand experts as to Tasmanian timbers.

Iron manufac-  
tur

Deposits.

Proportion in  
ore.

Proportion in  
earth.

Quantity of  
manganese con-  
tained.

Reference has already been made to the manufacture of iron. A few words may here be added on the subject. Iron ore is found in many parts of the Colony, but perhaps the most valuable deposits yet discovered are those in the neighbourhood of the new works before adverted to, on the west bank of the Tamar. They exist in the form of hematite and magnetic oxide in immense quantities—the whole of a hill being described as consisting of iron, whence it can be quarried at a slight cost. The proportion of metal contained in the ore is very high, one sample giving 70 per cent., as to which the assayer remarks that “its freedom from all obnoxious constituents will render it of great value for iron and steel manufacture.” The red oxide or earthy matter, of which the soil in parts is said to be almost wholly composed, yielded about 45 per cent. of metal. It was found to be free from sulphur and phosphorus, and therefore “calculated to make iron of the very highest quality.” The presence of such a notable quantity of manganese renders the ore particularly suited to the manufacture of the variety of pig iron known “by the name of ‘Spiegeleisen,’ which is of such importance in the manufacture of Bessemer steel.” Hardness is a special characteristic of the iron made from these ores.

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#### TASMANIAN CONTRIBUTIONS to the PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.

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NOTES.—The letter **▼** before the name signifies a Prizeholder for the same Exhibit in the Victorian Exhibition, 1875.

**✱**—This letter before the name signifies that the Exhibitor has been awarded a prize at the Philadelphia International Exhibition, 1876. The Government of Tasmania received also an award for its Collective Exhibit, and the Commissioners representing the Colony an award for the Collection of Ores and Rocks.

\* This star denotes that the Exhibitor presented the objects to the Academy of Natural Sciences, Philadelphia.

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#### DEPARTMENT I.

- Cl. 100. **▼** \*British and Tasmanian Charcoal Iron Company (Limited),  
T. H. Lempriere, Manager, 56, Queen Street, Melbourne.
1. Iron Ore from Ilfracombe on the River Tamar, a block.
  2. Earthen Brown Hematite.
  3. Iron Ore and Crystallised Brown Hematite.
  4. Oxides of Iron from Anderson's Creek, Western Tasmania.
- Cl. 101. Groom, Frederick, Harefield.
5. Coal from Harefield, St. Mary's, near Fingal.
- Cl. 100. Hammond, W., Hobart Town.
6. Bismuth from Mount Ramsey.
- Cl. 100. **▼** Harcourt, James, Hobart Town.
7. Samples of Pig Iron.
  8. Iron Ore, calcined and uncalcined.
  9. Iron Ore, from Bruny Island.
  10. Smelted Iron, from Derwent Iron Works, Hobart Town.
- Cl. 101. Harrap, A., Launceston.
11. Petrified Wood.
- Cl. 100. J. H. Innes, Hobart Town.
12. Tin Ore from Ringarooma and George's Bay.
- Cl. 100. **▼** \*Hematite Iron Works, West Tamar.
13. Pig Iron.
  14. Iron Ore, calcined.
  15. Iron Ore, uncalcined.
- Cl. 102. 16. Marble Limestone, Blue.
17. Marble Limestone, White.

- Cl. 100. \*Hull, Henry Jocelyn, Hobart Town.  
18. Tin Ore, from the deposit, George's Bay.
- Cl. 100. \*Just, Thomas Cook, Journalist, Charles Street, Launceston.  
19. Magnetic Iron Ore.  
20. Oxide of Iron and Asbestos in Serpentine Rock.
- Cl. 102. \*Lyell & Gowan, 46, Elizabeth Street, Melbourne (Australasian Slate Company, Limited).  
22. Slate from the Piper's River, on the North-east Coast, in the County of Lewisham, about 15 miles east of George Town.  
23. Tin Ore and Ingots, from the Don Tin Mining Company, Mount Bischoff.  
24. Marble Limestone, Black, Blue, and White, from the River Don.  
25. Coal from the River Don.
- Cl. 100. \*Mount Bischoff Tin Mining Company.  
26. Tin in Ingots (a ton), from Mount Bischoff.
- Cl. 102. \*Rayner, E., Bridgewater.  
27. Limestone, with large Fossils.
- Cl. 100. \*Smart, Dr., Hobart Town.  
28. Gold in Quartz, from the City of Hobart Mine, Fingal.
- Cl. 100. \*Smith, James, Launceston.  
29. Bismuth from Mount Ramsey.
- Cl. 100. \*Stanhope Company, Tasmania.  
30. Tin Ore.
- Cl. 200. \*Strachan, R., Cambridge.  
31. Salt, from Salt Works, Cambridge.
- Cl. 200. \*Kermode, W. A., Mona Vale.  
21. Salt, from Saltpan Plains, Mona Vale estate.

## DEPARTMENT II.

- Cl. 620. Archer, W. H. D., Longford.  
32. Wheat.  
33. English Barley.  
34. Linseed.
- Cl. 620. Creswell, C. F., Hobart Town.  
35. Wheat (*Red Tuscan*).  
36. Wheat (*Golden Drop*).  
37. Wheat (*Farmer's Friend*).  
38. Wheat (*Goldsmith's*).  
39. English Barley (*Malting*).  
40. Oats (black) (*Black Tartarian*).  
41. Oats (*Norway*).  
42. Oats (*Poland*).  
43. Rye.  
44. Tares (*Golden Spring*).  
45. Horse Beans.  
46. Grey Peas.  
47. Peas (*Blue and White*).  
48. Red Dutch Clover.  
49. Meadow Soft Grass Seed.  
50. Perennial Red Clover Seed.  
51. Sanfoin Seed.  
52. Lucerne Seed.  
53. Linseed.  
54. Canary Seed.  
55. Rape Seed.  
56. Cocksfoot Grass Seed.  
57. Italian Ryegrass Seed.  
58. Evergreen Perennial Ryegrass Seed.

- Cl. 624. { 59. Seed of the Blue Gum (*Eucalyptus globulus*).  
 Cl. 602. { 60. Seed of the Stringy Bark (*Eucalypta obliqua*).  
 { 61. Seed of the Blackwood (*Acacia melanoxylon*).  
 Cl. 600, { 62. Forest Trees, 24 Varieties.  
 620,624. { 63. Ryegrass Seed.  
 { 64. Clover Seed (white).  
 Cl. 620. ♡ Dalgety, Moore, & Co., Launceston.  
 { 65. Wheat (*Brown Velvet*).  
 { 66. Wheat (*Silver Drop*).  
 { 67. Wheat (*Purple Straw*).  
 { 68. Oats (*Tartarian*).  
 { 69. Oats (*Poland*).  
 Cl. 620. ♡ Gibson, William, Hobart Town.  
 { 70. Wheat.  
 Cl. 620. \*Graves, J. W., Hobart Town.  
 { 71. Native Bread (*Mylitta Australis*).  
 Cl. 624. Gulliver, B., Hobart Town.  
 { 72. Blue Gum Tree Seed (*Eucalyptus globulus*).  
 { 73. Blackwood Seed (*Acacia melanoxylon*).  
 { 74. Black Wattle Seed (*Acacia molissima*).  
 { 75. Silver Wattle Seed (*Acacia dealbata*).  
 Cl. 620. ♡ Harrap, Alfred, Launceston.  
 { 76. Wheat, *Boucher's Velvet*.  
 Cl. 620. ♡ Hogarth, D., Launceston.  
 { 77. Wheat, Winter (*Braemar Velvet*).  
 ♡ \*Hull, Hugh M., Hobart Town.  
 Cl. 600, { 78. Cubes of the following Woods of Tasmania:—Blue  
 601. Gum (*Eucalyptus globulus*); Stringy Bark (*Eucalyptus obliqua*); †Huon Pine (*Dacydium Franklinii*); Peppermint Gum (*Eucalyptus viminalis*); †Curly Gum (*Eucalyptus*); †She-oak (*Casuarina quadrivalis*); †He-oak (*Casuarina stricta*); Honeysuckle (*Banksia Australis*); King William Pine; †Oyster Bay Pine (*Callitries Australis*); Swamp Gum (*Eucalyptus*); †Myrtle (*Fagus Cuninghams*); †Musk (*Eurybia argophylla*); Box (*Bursaria*); Tea Tree (*Leptos-pernum*).  
 Cl. 620. \*Kemp, George, Upper Bagdad.  
 ♡ { 79. Wheat (*Armstrong's Prolific*).  
 { 80. Wheat (*Lamont's Prolific*).  
 Cl. 620. ♡ Lipscombe, Frederick, Sandy Bay.  
 Cl. 624. { 81. Seeds of the Blue Gum Tree, 50 lbs. weight. (*Eucalyptus globulus*).  
 Cl. 623. ♡ Sharland, W. C., New Norfolk.  
 { 82. Box of Hops, grown at New Norfolk.  
 Cl. 623. ♡ Shoobridge, Ebenezer, New Norfolk.  
 { 83. Box of Hops (*Golding*), grown at New Norfolk.  
 Cl. 620. \*Thomson, Mrs. John, Cormiston.  
 { 84. Native Bread (*Mylitta Australis*).  
 Cl. 657. ♡ Degraives, John, Hobart Town.  
 { 85. Malt from Tasmanian barley.  
 Cl. 657. ♡ Gracie, William, Hobart Town.  
 { 86. Malt from Tasmanian barley.

## DEPARTMENT III.

- Cl. 681. Anglo-Australian Guano Company.  
 { 87. Guano from Bird Island, procured by a Company whose establishment is in Hobart Town.

## Group 13.

- Cl. 603. \*Edwards, G. W., Hobart Town.  
 { 88. Grass-tree Gum (*Xanthorrhæa*), two samples.

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† Polished so as to show their value for veneers.

## Group 14.

- Cl. 104. \*Coverdale, Dr. John, Port Arthur.  
 Cl. 202. 89. Earth for Paints, red ochre.  
 90. Earth for Paints, red ochre in powder, from Port Arthur.  
 91. Pipeclay from Port Arthur.  
 Laughton, James, Hobart Town.  
 Cl. 104. 92. Earth for Paints, umber coloured.  
 Cl. 202. 93. Earth for Paints, sienna coloured.  
 Cl. 662. ▼ \*Lunatic Asylum Commissioners of Tasmania.  
 94. Oil from the Blue Gum tree (*Eucalyptus globulus*).  
 Cl. 603. Mitchell, Mrs.  
 95. Gum from the Oyster Bay Pine Tree (*Callitris Australis*).

## DEPARTMENT VI.

## Group 17.

- Cl. 667. ▼ \*Silver Medal to Tasmanian Commissioners.  
 Cl. 667. \*Archer, William Henry Davies, Brickendon, Longford.  
 { 96. Fleece of Pure Merino Lamb's Wool, hot water washed.  
 } 97. Fleece of Pure Merino, ditto.  
 } 98. Fleece of Pure Merino Ewe, ditto.  
 } 99. Fleece of Wool in the grease.  
 Cl. 667. \*Brock, J., Campania.  
 99a. Fleece of Pure Merino, which took the first prize at the Richmond Show.  
 Cl. 667. \*Cameron, the Honorable Donald, Burnside and Fordon.  
 100. Fleece of Pure Merino.  
 101. Fleece of Pure Merino.  
 102. Fleece of Pure Merino.  
 Cl. 667. \*Gibson, James, Belle Vue, Cleveland.  
 { 103. Portrait of "Sir Thomas." Pure Merino Ram.  
 } 104. Fleece of Pure Merino Ram, in grease, 365 days' growth.  
 } 105. Fleece of Pure Merino Ewe, in grease, 365 days' growth.  
 } 106. Fleece of Pure Merino Lamb, about four months' growth.  
 NOTE.—Mr. Gibson is the breeder of "Sir Thomas," a Ram which was sold in Melbourne for 714*l*.  
 Cl. 667. \*Gibson, William, & Son, Scone, Perth.  
 { 107. Fleece of Prize Merino Ram "The Duke" (in the grease).  
 } 108. Fleece of Pure Merino Ewe (in the grease).  
 } 109. Fleece of Pure Merino Ewe (washed).  
 } 110. Fleece of Pure Merino Hoggett (washed).  
 } 111 & 112. Portraits of "The Duke," a Prize Ram, and other Prize Merino Sheep; photograph by W. Gibson, jun.  
 Cl. 667. \*Gibson, William Henry, Fairfield, Snake Banks.  
 { 113. Fleece of Pure Merino Ram, 2-tooth.  
 } 114. Fleece of Pure Merino Ewe, 2-tooth.  
 Cl. 667. \*Headlam, Charles, Egleston, Macquarie River.  
 { 115. Fleece of Pure Merino.  
 } 116. Fleece of Pure Merino.  
 } 117. Fleece of Pure Merino.  
 Cl. 667. \*Keach, George William, Chiswick, Ross.  
 118. Fleece of four-year old Ram, 364 days' growth; weight of fleece, 9½ lbs.; combing Merino (in the grease).  
 119. Fleece of two-year old Ewe, 364 days' growth; weight of fleece, 8 lbs. when shorn; slightly skirted owing to scour; combing Merino (in the grease).

- Cl. 667. \*Mac Lanachan, the Honourable James, Ballochmyle.  
 { 120. Fleece of Pure Merino Ram, in the grease, 11 lbs. weight.  
 P { 121. Fleece of Pure Merino Ram, in the grease, 10 lbs. ditto.  
 { 122. Fleece of Pure Merino Ram, in the grease, 10 lbs. ditto.
- Cl. 667. \*Parramore, Thomas, Beaufort, Ross.  
 { 123. Fleece of Pure Merino Ram (in grease), 14 months old.  
 P { 124. Fleece of Pure Merino Ewe (warm water washed) 2½ years old.  
 { 125. Two Fleeces of Pure Merino Ewes (warm water washed).  
 { 126. Bale of 50 lbs. weight of Wool.
- Cl. 667. Lindley, George Wm., Runnymede, Richmond.  
 { 127. Fleece of Leicester Wool.
- Cl. 667. P \*Shaw, Frederick, Redbanks, Swansea.  
 { 128. Fleece of Leicester Wool.
- Cl. 667. \*Sharland, William Stanley, Woodbridge, New Norfolk.  
 P { 129. Fleece of Pure Merino.  
 { 130. Ditto ditto.
- Cl. 667. \*Page, Samuel, Belle Vue, New Town.  
 P { 131. Fleece of Pure Merino, hot water washed.  
 { 132. Ditto ditto.  
 { 133. Ditto ditto.
- Cl. 667. \*Taylor, George, Milford, Campbell Town.  
 { 134. Fleece from Stud Merino Ram.  
 { 135. Ditto ditto.  
 { 136. Ditto ditto.  
 P { 137. Ditto ditto.  
 { 138. Ditto ditto.  
 { 139. Ditto ditto.  
 { 140. Two Fleeces from Breeding Ewes.  
 { 141. Ditto ditto.
- Cl. 667. \*Taylor, John, Winton, Campbell Town.  
 { 142. Bale of Wool from yearling Merino Ewes, washed and skirted.  
 P { 143. Fleece of yearling Merino Ewe, washed and skirted.  
 { 144. Ditto ditto.  
 { 145. Ditto ditto.  
 (The bale of Wool to be forwarded after exhibition to Messrs. H. G. Ashurst & Co., Fenchurch Street, London.)
- Cl. 667. \*Taylor, David, St. Johnstone's, Macquarie River.  
 P { 146. Fleece of pure Merino, in the grease.  
 { 147. Ditto ditto.  
 { 148. Ditto ditto.
- Cl. 667. Wilson, George, Huntsworth and Ashgrove, Oatlands.  
 { 149. Fleece of pure Merino.  
 P { 150. Ditto ditto.  
 { 151. Ditto ditto.
- Cl. 667. Ralston, John, Logan, Evandale.  
 { 152. Fleece of pure Merino.  
 P { 153. Ditto ditto.  
 { 154. Ditto ditto.  
 { 155. Ditto ditto.

## DEPARTMENT VIII.

## Group 20.

- Cl. 650, \*Coverdale, Dr. John, Fort Arthur.  
 656. { 156. Gelatinous Sea-weed, said to produce a valuable jelly for the table.  
 { 157. Jelly made from the Seaweed.

## Cl. 645. ▼ Davies, R. H., Torquay.

158. Tasmanian Shells:—*Haliotis albicans*, Quoy, Voy. of *Astrolabe* III., p. 311; *Haliotis neovosa*, Martyn; *Cassis semigranosa*, Lamk.; *Cassis pyrum*, Lamk.; *Voluta fusiformis*, Sw.; *Voluta undulata*, Lamk.; *Dosinia grata*, Reeve; *Pupura textilosa*, Lamk.; *Fusus pyrulatus*, Reeve; *Fusus Tasmaniensis*, Ad. and Aug., Proc. Zool. Soc., 1863, p. 421; *Fusus Beckii* (?), Reeve, Icon. VIII., 35; *Natica Strangei* (?) Reeve; *Natica conica*, Lamk.; *Sigaretus zonalis*, Gray; *Fissurella macrochisma*, Gray; *Fissurella scurella*, Gray; *Modiola albicostata*, Lamk.; *Modiola Australis*, Lamk.; *Triton cutaceus*, Lamk.; *Triton subdistortus*, Lamk.; *Triton Barthelemyi*, Bernard; *Phasianella Australis*, Gmelin; *Phasianella ventricosa*, Quoy and Gamar; *Fasiolaria fusiformis*, Phil.; *Fasiolaria coronata*, Lamk.; *Nerita atrata*, Lamk.; *Lophyrus Australis*, Sowerby; *Lepidopleurus variegatus*, Ad. and Aug., Proc. Zool. Soc., 1864; *Mitra glabra*, Swains, Exot. Conch., p. 21; *Patella tramoserica*, Martyn; *Patella costata*, Sowerby; *Patella* sp.; *Patella Gealii*; *Ancillaria marginata*, Lamk.; *Emarginula Australis*, Quoy; *Zizyphinus armillatus*, Wood; *Myrtilus Menkeanus*; *Mactra rufescens*, Lamk.; *Conus Novæ Hollandiæ*, A. Adams; *Waldheimia Australis*, Quoy; *Risella melanostoma*, Gmelin; *Risella aurata*, Quoy, Voy. *Astrolabe*; *Risella nana*, Lamk.; *Turritella Tasmanica*; *Chitonellus Gunnii*, Reeve; *Stomatella imbricata*, Lamk.; *Scalaria granulosa*, Sowerby; *Amphibolina fragilis*, Lamk.; *Uvanilla squamifera*, Koch in Phil. Abbild., p. 4, f. 9; *Bittium granarium*, Kiener; *Diloma Odontis*, Woods; *Cypræa angustata*, Gray; *Cypræa Comptoni*, Gray; *Siliquaria Australis*, Quoy; *Marginella muscaria*; *Mesodesma triquetra*, Reeve; *Mesodesma erycina*, Dsh.; *Mesodesma natida*; *Turbo undulatus*, Chem.; *Arca velata*, Sow., Proc. Zool. Soc., 1833; *Vulsella Tasmanica*, Reeve; *Eleuchus nitidus*, Phil.; *Eleuchus irrisodontes*, Quoy; *Siphonaria denticula*, Quoy; *Littorina unifasciata*, Gray; *Nassa Pauperata*, Lamk.; *Veneruftris carditoides*, Lamk.; *Veneruftris Diemensis*; *Semele* sp.; *Murex triformis*; *Vermetus dentiferus*, Quoy; *Tellina albida*, Lamk.; *Trochocochlea striolata*, Wood; *Buccinum alveolatum*, Kiener; *Par-mophorus Australis*, Lamk.; *Clanculus undatus*, Montfort; *Sanguinolaria livide*; *Auricula cornea*, Swainson; *Tapes* sp.; *Venus aphrodinoides*; *Venus gallinula*, Lamk.; *Venus roborata*; *Venus aphrodinoides*, vara.; *Venus lamellata*, Lamk. *Venus gallinula* var. a.

(These Shells were named and arranged by the Rev. Julian Woods, M.A., and Mr. Le Grand.)

## Cl. 641. ▼ P \*Salmon Commissioners of Tasmania.

159. Brown Trout, in spirits of wine.

## DEPARTMENT IX.

## Cl. 652. ▼ Tasmanian Commissioners.

160. One large Black Opossum Rug, made by *Omant*; one ditto, made by *Schmidt*; one large Grey Opossum Rug, made by *Omant*; one ditto, made by *Schmidt*; Grey Native Cat-skin Rug, made by *Schmidt*; Ringtailed Opossum Rug, made by *Omant*; Skins of the Kangaroo; Skins of the Wallaby; Skins of the Grey Opossum; Skins of the Black Opossum; Skins of the Wombat; Tiger Skins; Seal Skin; Skins of Albatross, Pelican, and Penguin; Skins of Platypus, Ringtail Opossum, Tiger Cat, Native Cat, Kangaroo Rat.

† Specimens of the Platypus were presented to H.I.M. the Emperor of Brazil by H. P. Welsh, Esq., Tasmanian Commissioner.

## Cl. 652. Archer, W. H. D., Longford.

161. Large Forester Kangaroo skins (6); small Forester Kangaroo skins (6); Wallaby skins (6); Black Opossum skins (10); Grey Opossum skins (10); Black Native Cat skins (6); Tiger Cat skins (8); Grey Native Cat skins (4); Ring-tailed Opossum skins (2); Rock Opossum skins (3); Bush Rat skins (3); Tiger skins (3); Platypus skins (5); Penguin skins (6); Grebe skins (3); Flying Squirrel skins (3); Sea Hawk skin (1); Pelican skins (3); Wombat skins (2); Devil skins (2); Kangaroo Rat skins (2); Bandicoot skin (1); †one cream-coloured Opossum (*stuffed*); †one Platypus (*stuffed*).

*Group 22.*

## Cl. 656. ▼ Holroyd, Kennedy, &amp; Co., Hobart Town.

162. Jams and Tart Fruits (5 cases).

## DEPARTMENT XIII.

*Group 34.*

## Cl. 218. ▼ Carlsen, P. O., Port Arthur.

163. Carved Ivory and Wood Egg and Cruet Stand.

## DEPARTMENT IV.

*Group 36.*

## Cl. 219. ▼ Coverdale, Dr., Port Arthur.

164. Spinning Jenny, made of Tasmanian Myrtle, carved and made by P. O. Carlsen.

## Cl. 219. ▼ Blyth, Miss, Hobart Town.

165. Ornamental Table Top, with wreath of Tasmanian flowers painted on top.

## Cl. 219. ▼ Hope, Miss Mary, Hobart Town.

166. Ornamental Table, with wreath of Tasmanian flowers painted on top.

## Cl. 219. ▼ Graves, Mrs. John Woodcock.

167. Table top, with Tasmanian Ferns.

## Cl. 251. ▼ Bidencope, J., Hats and Caps.

## DEPARTMENT XVIII.

*Group 49.*

## Cl. 269. ▼ \*Moir, Joseph, &amp; Co.

168. Assortment (19 sizes) of Shot, made at Queenborough Shot Tower.

## DEPARTMENT XXII.

*Group 60.*

## Cl. 306. \*Hull, Hugh M., Hobart Town.

169. "Hull's Hints to Emigrants," 200 copies, from the Author.

## Cl. 306. \*Tasmania, Commissioners of.

170. Newspapers, 1,000 copies of "*Mercury*;" 50 copies of "*Christian Witness*."

## Cl. 304. 171. Volume of Statistics, from the Government Statistician.

172. Volume of Legislative Council Journals for Session 1874, from Clerk of the Council.

173. Volume of the House of Assembly Journals for 1874, from Clerk of the House.

† These two Exhibits are presented by the exhibitor to the Academy of Natural Sciences, Philadelphia.

- Cl. 306. \*Walch & Sons, Hobart Town.  
 174. "Guide to Tasmania."  
 "Walch's Tasmanian Almanac for 1875," from the  
 Publishers.

*Group 61.*

- Cl. 300, \*Cemetery Commissioners of Hobart Town.  
 301. 175. Chart of the General Cemetery, Hobart Town.  
 Cl. 300, \*Hull, Hugh M., Hobart Town.  
 301. 176. Map of Tasmania, showing the alienated portions, the  
 railways and roads, towns and villages.  
 Cl. 300, \*Moore, Hon. William, Minister of Lands, Hobart Town.  
 301. 177. Map of Tasmania, showing the gold, coal, iron, and tin  
 deposits.  
 Cl. 300, \*Walch & Sons, Hobart Town.  
 301. 178. Chart of the City of Hobart Town, showing the  
 electoral divisions.  
 179. Chart of the Town of Launceston, showing the elec-  
 toral divisions.

*Group 66.*

- Cl. 300, \*Royal Society of Tasmania.  
 301. 180. Meteorological Tables, published by the Society for  
 30 years.  
 Cl. 300, Walch & Sons, Hobart Town.  
 301. 181. Tasmanian Postage Stamps.

*Group 82.*

- Cl. 300, Hull, Mrs. Hugh, Hobart Town.  
 301. 182. Pencil Drawing, "Avoca, in Tasmania, by Moon-  
 light."

*Group 83.*

- Cl. 300, \*Randall, A., C.E., Engineer to the Hobart Town Waterworks,  
 301. Hobart Town.  
 183. Chart of the Hobart Town Waterworks.  
 Cl. 300, Dibbs, T. F., Launceston.  
 301. 184. Chart of Launceston.

*Group 84.*

- Cl. 430. ▼ Baily, H. H., Hobart Town.  
 185. Photographic Rembrandt Portraits.  
 186. Photographic Portrait Album.  
 187. Tasmanian Views, 2 books.  
 Cl. 430. \*Corporations of Hobart Town and Launceston.  
 188 & 189. Plates of Photographic Views of the City of  
 Hobart Town and of the Town of Launceston.  
 Cl. 430. Hull, Hugh M., Hobart Town.  
 190. Portrait of last Tasmanian Aboriginal Man, "Billey  
 Lanney," photographed from life by Charles Woolley. Framed  
 in musk wood.  
 191. Portraits of Aboriginal Women, "Wapperty" and  
 "Patty." Photographed from life by Charles Woolley.  
 Framed in she-oak wood.

192. Portraits, "Lalla Rookh," the sole survivor of the Tasmanian Aborigines, and "Bessy Clarke." Photographed from life by Charles Woolley. Framed in myrtle wood.
- Cl. 430. Tondeur & Lempriere, Melbourne.  
193. Photographs of the British and Tasmanian Charcoal Iron Company (Limited), Tasmania.

## DEPARTMENT XXVI.

*Group 88.*

- Cl. 304. \*Tasmania, Commissioners of.  
194. Statistical Tables of Tasmania, 1870-74.
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**VICTORIA.**

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**COMMISSION FROM VICTORIA**

TO THE

**INTERNATIONAL EXHIBITION, PHILADELPHIA, 1876.**

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**Sir REDMOND BARRY, K.C.M.G., Acting Chief Justice of the Supreme Court, President.**

**The Hon. James Joseph Casey, M.P.**  
**The Hon. James Forrester Sullivan, M.P.**

**The Hon. Caleb Joshua Jenner, M.L.C.**  
**The Hon. James Munro, M.P.**

**John M'Ilwraith, Esq.**

**Count de Castlenau.**

**The Hon. S. H. Bindon.**

**Joseph Bosisto, Esq., M.P.**

**James Gatehouse, Esq., Mayor of Melbourne.**

**Rev. John Ignatius Bleasdale, D.D.**

**The Hon. Sir John O'Shanassy, K.C.M.G.**

**The Hon. Sir James M'Culloch, M.P.**

**The Hon. John Alexander Macpherson, M.P.**

**The Hon. John Thomas Smith, M.P.**

**Leslie James Sherrard, Esq.**

**John Danks, Esq., Mayor of Emerald Hill.**

**John McIntyre, Esq.**

**George Collins Levey, Esq., Secretary.**

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**RESIDENT COMMISSIONERS AT PHILADELPHIA.**

**Sir Redmond Barry, K.C.M.G.**

**J. M'Ilwraith, Esq.**

**John McIntyre, Esq., and**

**George Collins Levey, Esq., Secretary.**

## VICTORIA, AUSTRALIA.

VICTORIA, the most populous colony in Australia, is situated on the southern extremity of the continent, and extends from the 34th to the 39th parallel of south latitude, and from the 141st to the 150th meridian of east longitude. Its extreme length from east to west is about 420 geographical miles, and its greatest breadth 250 miles. The extent of coast-line is nearly 600 miles. The area of Victoria is 88,198 square miles, or 56,446,720 acres, or the thirty-fourth part of the whole surface of Australia, an extent about equal to that of England, Wales, and Scotland, which contain 89,644 square miles. Victoria is therefore very much smaller than any of its neighbours on the mainland of Australia, although its population is very near as large as all the others put together. The highest mountain in Victoria, Bogong, has an elevation of 6,508 feet, and there are several ranging from 4,000 to 6,000 feet. The Murray runs along the northern boundary for 670 miles, but the Gouldburn, with a length of 230 miles, is the longest river which throughout its course flows wholly in Victoria.

Position.

Area.

Mountain ranges.

Rivers.

Owing to its geographical position Victoria enjoys a climate cooler and more invigorating than any other Australian colony. The mean temperature of the air in Melbourne, derived from a series of observations extending over a period of 14 years, is 57°·6. Upon examining a chart showing isothermal lines, it will be found that the Victorian capital is situated upon or near the line corresponding with that on which, in the northern hemisphere, Marseilles, Bordeaux, Bologna, Nice, Verona, and Madrid are situated. The difference between winter and summer, between the hottest and the coldest month, is, however, less in Victoria than in any of the places mentioned, and the European city whose climate most resembles that of Melbourne is Maffra, 18 miles north-west of Lisbon, and 700 feet above the level of the sea.

Climate.

The three months from September to November are considered to be the spring quarter, those from December to February the summer, from March to May autumn, and from June to August winter. January and February are the warmest months, June and July the coldest. The observations taken for 17 years show that on 61 occasions the thermometer has risen above 100° Fahrenheit, and that there are 52 instances of its having fallen to or below freezing point. The mean temperature of the air during the two hottest months has been 66°·7 in January, and 65°·6 in February, while the coolest, June, shows 49°·0, and July 47°·7. The above figures give the temperature of Melbourne. The hill districts in the interior, which enjoy an elevation of from 1,000 to 2,000 feet above the level of the sea, are rather cooler, while the plains are slightly warmer than the metropolis. The mean temperature of the air throughout the year at Ballarat, 1,438 feet above the level of the sea, is 53°·9, as compared with 57°·6 in Melbourne, while at Sandhurst it is as high as 58°·6.

Dates of seasons.

Mean temperatures.

The rainfall at Melbourne differs very considerably in different years. The year of the greatest rainfall was 1849, in which 44°·25 inches of rain fell; next came 1863, with 36°·42 inches, and 1870, with 33°·77 inches. The year when the least rain fell was 1865, with 15°·94 inches. The rainfall is tolerably well distributed throughout the year, the mean number of days upon which rain fell during the past 35 years being 135·5, of which the spring quarter contributed 40·3, the summer 24·4, the autumn 28·9, and the winter 41·9. The mean annual rainfall is 27°·58 inches, compared with 49°·95 in Sydney, and 21°·36 in Adelaide.

Rainfall.

The hot winds of Victoria form the peculiar feature of its climate which is most talked about in other countries and is most dreaded by new arrivals. They frequently set in about 9 a.m., and blow from the north with great violence, raising clouds of dust. Vegetation becomes parched up, fruit falls

Hot winds

from the trees, and animals as well as human beings appear to be greatly oppressed. The time is a trying one for young children and invalids. The wind often changes to the south towards evening, but sometimes continues to blow from the north for two and even three days. When the welcome southerly wind sets in it frequently does so in a heavy squall, accompanied with drops of rain and thunder and lightning, and the thermometer sometimes falls as much as 20 or 30 degrees in half an hour. According to Neumayer, the average number of hot winds for the whole colony is eight or nine per annum, but the number is different in different localities, according to the following classification :—

Sudden falls in thermometer.

Average number of hot winds per annum.

Average Number of Days of Hot Wind per Annum.

Melbourne and Castlemaine	-	-	14
Sandhurst, Heathcote, and Portland	-	-	11
Beechworth, Ararat, and Swan Hill	-	-	8
Geelong and Ballarat	-	-	6
Alberton and Camperdown	-	-	3

Hot winds not without advantage.

The hot winds are not, however, by any means unmixed evils. The intense dryness produced by them acts as a powerful disinfectant, and that dampness which in the south of Europe produces such prejudicial effects is entirely unknown in Victoria.

Present population.

The present population of Victoria is in round numbers 852,000. The latest census, taken in 1871, gave 731,528, of whom 401,050 were males and 330,478 females, residing in 158,481 houses. The increase which has since taken place from immigration and the excess of births over deaths has done much to reduce the difference between the sexes, and the numbers may now be set down at 440,000 males and 405,000 females.

Various censuses.

The various censuses which have been taken since the first settlement of Melbourne give the accompanying results :—

Date of Enumeration.	Population.			Number of Houses.
	Persons.	Males.	Females.	
25th May 1836	177	143	35	—
8th November 1836	224	186	38	—
12th September 1838	3,511	3,080	431	—
2nd March 1841	11,738	8,274	3,464	1,490
2nd March 1846	32,879	20,184	12,695	5,198
2nd March 1851	77,345	46,202	31,143	10,935
26th April 1854	236,798	155,887	80,911	—
29th March 1857	410,766	264,334	146,432	102,001
7th April 1861	540,322	328,651	211,671	134,332
2nd April 1871	731,528	401,050	330,478	158,481

Chinese and aborigines in Victoria.

Population to square mile of Victoria ;

of Melbourne.

Of the present population of Victoria, about 17,000 are Chinese, and 1,330 Aborigines.

Victoria contains 8·268 persons to the square mile, or rather less than in the empire of Russia, which has 10, and much less than the United States, which has 14 inhabitants. The population is very unevenly divided. Melbourne, the capital of Victoria, has with its suburbs a population of 250,000, rather less than Boston, U.S., or Sheffield, but larger than Hamburg, while in the county of Weeah, in the extreme north-west of the colony, there was not a single inhabitant on the night upon which the census was taken. Ballarat, the second city in Victoria, has 47,201 inhabitants, Sandhurst 28,577, Geelong 21,459 ; then come Castlemaine, with a population of 9,322, Clunes 6,068, Stawell 5,166, and Daylesford 4,696. The disproportion of the sexes is confined to the remoter districts, for in 18 of the cities, boroughs, and towns, the females were in excess of the males.

The accompanying table shows the various nationalities of the people of Victoria in 1871. Table of nationalities in 1871.

Where born.	Numbers.		
	Persons.	Males.	Females.
<i>British Possessions.</i>			
Victoria - - - -	329,597	165,573	164,024
Other Australasian Colonies - -	28,669	14,308	14,361
England - - - -	164,287	97,796	66,491
Wales - - - -	6,614	4,189	2,425
Scotland - - - -	56,210	31,475	24,735
Ireland - - - -	100,468	49,198	51,270
Other British Possessions -	3,870	2,641	1,229
<i>Foreign Countries.</i>			
France and French Colonies -	1,170	857	313
Germany - - - -	8,995	6,591	2,404
Austria - - - -	269	256	13
Other European Countries -	6,806	5,672	534
United States of America -	2,423	1,776	647
China - - - -	17,857	17,826	31
Other Countries - - -	815	214	101
At Sea - - - -	2,064	1,095	969
Total specified - - -	729,014	399,467	329,547
Unspecified - - - -	2,514	1,583	931
Total Population -	731,528	401,050	330,478
<i>Allegiance.</i>			
British Subjects - - -	695,982	369,228	326,704
Foreign Subjects - - -	34,854	31,415	3,439
Allegiance unknown - -	742	407	335

Of the whole population, 257,835 belong to the Church of England, 112,983 are Presbyterians, 170,620 Roman Catholics, 94,220 Wesleyans, 18,191 Independents, 16,311 Baptists, 10,559 Lutherans, 3,571 Jews, and 17,650 Chinese are returned as Pagans. Number of each religion in colony

Of every thousand persons over five years, the number who could read and write was 804, and of those who could read only, 128, leaving 68 totally uneducated. Of the population over twenty-one, 871 could read and write, and 74 could read only, leaving 55 per 1,000 of the adult population wholly uneducated. Primary education in Victoria is now free, compulsory, and secular. Elementary Educational Statistics.

The higher education of the people of Victoria is conducted by several Grammar Schools, which are attended by 1,800 pupils, and by the University of Melbourne, founded in 1854, which had in 1874, 396 graduates, and 177 matriculated students attending in the different faculties. Higher education.

The public library of Melbourne, which imposes no restrictions whatever on its visitors, is an important adjunct in the education of the inhabitants of the country. The number of volumes is 87,557, and the number of readers in 1875-6 was 339,476. Public Library.

In addition to this, a large number of volumes were lent for periods ranging from three to six months to other towns not possessed of public libraries of their own.

Victoria was first discovered by Captain Cook in 1770, but the first permanent settlement did not take place until 1834, when the Messrs. Henty Discovery of colony.

Separate existence as colony in 1851.

Revenues and resources the preceding year.

Increase from discovery of gold.

Constitutions granted to Australian colonies.

Their basis.

Legislature.

Members.  
Electors.

Responsible Ministers.

Defences.

Revenue and expenditure.

established a whaling establishment at Portland. In 1836 Batman and Fawcner crossed from Tasmania and took up their residence on the banks of the River Yarra, near the site of the present city of Melbourne. The fact that, as throughout the greater portion of Australia, the land was well adapted for cultivation, that sheep and cattle could thrive upon the natural grasses of the country, and could live in the open air throughout the year, attracted a large immigration; and in 1851, when Victoria was separated from New South Wales, and commenced an independent existence, the population numbered 76,000, the sheep 6,000,000, the cattle 380,000, the horses 21,000, and the land in cultivation 52,000 acres. In the preceding year the public revenue had amounted to 260,000*l.*, the public expenditure to 196,000*l.*, the imports to 745,000*l.*, the exports to 1,000,000*l.* The ships which arrived numbered 555, of an aggregate tonnage of 108,030, and the ships which departed numbered 508, of an aggregate tonnage of 87,087. The wheat grown amounted to 550,000 bushels, the oats to 100,000 bushels, the hay to 21,000 tons. The wool exported amounted to 18,000,000 lbs., and the tallow to 10,000,000 lbs.

The discovery of gold, which took place in 1851, enormously increased the population and revenues of the Yarra colony. For many years the principal export was gold, but the production of this precious metal is now of less importance than that of the great staple, wool. Of the exports in 1874, amounting altogether in value to 15,441,109*l.*, wool was valued at 6,373,641*l.*, and gold at 4,053,288*l.*

The important position which the Australian colonies had obtained in consequence of the discovery of gold, and the influx of population consequent thereon, induced the Imperial Government to determine, in the latter end of 1852, that each colony should be invited to frame such a Constitution for its government as its representatives might deem best suited to its own peculiar circumstances. The Constitution framed in Victoria, and afterwards approved by the British Parliament, was avowedly based upon that of the United Kingdom. It provided for the establishment of two Houses of Legislature, with power to make laws, subject to the assent of the Crown, as represented generally by the Governor of the Colony; the Legislative Council to consist of thirty, and the Legislative Assembly to consist of sixty members. Members of both Houses to be elective, and to possess property qualifications. Electors of both Houses to possess either property or professional qualifications, the property qualification of both members and electors being lower in the case of the Assembly than in that of the Council. The Council not to be dissolved, but five members to retire every two years, and to be eligible for re-election. The Assembly to be dissolved every five years, or oftener, at the discretion of the Governor. Certain officers of the Government, four at least of whom should have seats in Parliament, to be deemed "Responsible Ministers." Any member of either House accepting a place of profit under the Crown to vacate his seat, but to be capable of being re-elected. This Constitution was proclaimed in Victoria on the 23rd November 1855, and with certain modifications is still in force. The most important modifications are the reduction by one-half of the property qualifications of both members and electors of the Council, the total abolition of the property qualifications for both electors and members of the Assembly, the increase of members of the Assembly from sixty to seventy-eight, shortening the duration of their term of holding the seat from five years to three, and paying the members both of Council and Assembly.

No Imperial troops are stationed in Victoria, the defence force consisting of 196 paid artillerymen, 4,100 volunteers of various arms, together with a monitor and line-of-battle ship with 52 heavy guns, and 340 officers and men for harbour defences.

The revenue for the year 1874 was 4,106,790*l.*, and the expenditure 4,177,337*l.*, the revenue being 5*l.* 4*s.* 0*d.*, and the expenditure 5*l.* 5*s.* 10*d.* per head. Of the whole revenue, about 1,800,000*l.* is raised from Customs and Excise, 600,000*l.* from the sale and rents of Crown Lands, 900,000*l.* from the receipts from railways which are the property of the State, and 200,000*l.* from the Post and Telegraph Offices. Of the whole expenditure, the interest upon the public debt of 12,485,432*l.* absorbed 726,142*l.*, the railways were worked at a cost of 442,624*l.*; 537,758*l.* was expended upon public instruction,

200,000*l.* upon railways, 579,500*l.* upon public works, and 272,289*l.* upon charitable institutions, such as hospitals, orphanages, and industrial schools.

The greater portion of Victoria is divided into municipalities, some urban, which, according to their importance, are styled cities, towns, or boroughs; the others rural, which are designated shires. Each municipal district is a body corporate, with perpetual succession and a common seal, and is capable of suing and being sued, holding and alienating land. The number of municipal districts is 60 urban and 110 rural, the population 773,711, the number of ratepayers 171,746, and the number of dwellings 166,124. The whole of the colony, with the exception of the mountains, is now included in these municipalities. The annual value of the properties taxed is set down at 5,995,477*l.*, and the municipal revenue from all sources at 985,014*l.*, including a subsidy from the Government. The greater portion of the expenditure is upon public works, the salaries only amounting to 95,569*l.*, or about 10 per cent.

The number of electors was, for the Council 27,930, for the Assembly 146,937. The only qualification for an elector of the Assembly is, that he be either a natural-born subject of Her Majesty, or that, if an alien, he have been naturalized for five years, and have resided in the colony for two years.

The system of transferring land, whereby a fresh title from the Crown is given to every purchaser, was inaugurated in Victoria in 1862 by the Real Property Act, and has since been perfected under other Statutes. All lands alienated from the Crown after the commencement of the Act named have come at once under the provisions of this law, and land alienated prior to its passing can be brought under it, provided a clear title can be produced, or a title containing only a slight imperfection. In the latter case, the title is given subject to such imperfection, which is noted on the deed. As the Government takes the responsibility of the title, and may occasionally, notwithstanding every care, pass properties in respect to which claims may arise at some future time, an assurance and indemnity fund, to secure the Government against possible losses, is formed, chiefly through the payment by each person bringing property under the Statute of an amount equal to one halfpenny in the pound of the value of such property. One claim only, amounting to 250*l.*, has been paid out of this fund since the first introduction of the system. The balance to the credit of the fund at the end of 1874 was 29,119*l.* 1*s.* 4*d.*, of which amount 23,000*l.* had been invested in Government stock.

The number of insolvencies in 1874 was 776. 23,856 persons were taken into custody by the police, of whom 6,929 were discharged, 16,233 summarily convicted, and 694 committed for trial. 10,981 persons were arrested for drunkenness, and 5,058 for other offences against good order. 10 arrests were on charges of murder, 28 of manslaughter, and 3,000 for offences against property. Of the 694 persons committed, 436 were convicted.

The imports in 1874 were valued at 16,953,985*l.*, and the exports at 15,441,109*l.*, or 21*l.* 4*s.* 7*d.* per head of the population for imports and 19*l.* 6*s.* 8*d.* for exports. Of the whole exports, 11,352,515*l.* were the produce or manufacture of Victoria; of the imports 8,369,523*l.* were from the United Kingdom, and 5,496,776*l.* from the other Australian colonies. Eighty per cent. of the imports are landed, and ninety per cent. of the exports are shipped, at the Port of Melbourne.

The number of vessels entered was 2,100, of an aggregate tonnage of 777,110 tons, while 2,122, of 792,509 tons, cleared. The nationality of the ships entering, was Colonial 1,714, British 289, Foreign 97.

The number of post offices is 802; the number of letters despatched and received 15,738,888, newspapers 6,866,918. The income of the post office was 194,339*l.*, and the expenditure 288,574*l.* 216 post offices issue money orders. There are 148 telegraph stations, 4,464 miles of wire, and the telegrams despatched in 1874 amounted to 701,080.

The total number of miles of Government railway opened or in course of construction is 985, and of private railways 17; the total distance travelled in 1874 was 2,109,227, the number of persons travelling being 5,374,841, and the weight of goods 904,670 tons. The total receipts on Government and private lines was 1,016,926*l.*, the rates charged varying from 1*d.* to 2*d.* per mile according to class.

Municipalities.

Number of electors for Council and Assembly.

System of transferring land direct from Crown inaugurated by Victoria.

Insolvencies in 1874.

Imports and exports in 1874.

Number of vessels entered and tonnage.

Number of post offices.

Telegraph stations.

Number of miles of Government and private railways.

**Wages.**

Wages vary from 15s. to 20s. per week and rations to farm labourers, and 12s. to 15s. per week with rations for labourers employed on sheep stations, to 11s. and 12s. per day, without rations, for mechanics, and 7s. per day, without rations, for town labourers. Seamen receive from 6l. to 7l. per month, and female servants from 30l. to 60l. per annum with board and lodging.

**Market prices.**

The prices of the following articles are given as follows in the official returns:—

Wheat, per bushel, 4s. 9d. to 7s. 3d.	Milk, per quart, 6d.
Bread, 6d. to 8d. per loaf.	Potatoes, 4l. 10s. per ton.
Flour from 12l. to 15l. per ton.	Cabbages, 1s. per dozen.
Beef, 4d. to 6d. per lb.	Horses, 5l. to 40l.
Mutton, 2½d. to 6d. per lb.	Fat cattle, 5l. 10s. to 12l. 10s.
Butter, 1s. to 1s. 6d. per lb.	Fat sheep, 5s. to 20s.
Cheese, 9d. to 1s. per lb.	

**Rent.**

The weekly rent of a dwelling suitable for a mechanic and his family ranges, in the suburbs of Melbourne, from 8s. to 15s. In other towns it is lower, and in country districts the erection, on Crown lands, of a cottage of sawn or split timber, with a shingle or bark roof, which can be accomplished at a trifling cost, often enables the man of small means to save rent altogether. In all the large towns, owing to the facilities offered by building societies and other financial institutions for obtaining advances of money on easy terms, numbers of labouring men possess freeholds of their own.

**Land Sales Act.**

The mode of acquiring land from the Crown is under the Land Sales Act. 320 acres is the largest amount which any one person is allowed to select. The selection is held under license during three years, within which period the licensee must reside on his selection at least two and a half years, must enclose it, cultivate 1 acre out of every 10, and generally effect substantial improvements to the value of 20s. per acre. The rent payable during this period is 2s. per acre per annum, which is credited to the selector as part payment. At the expiration of the three years' license, the selector, if he obtain a certificate from the Board of Lands and Works that he has complied with these conditions, may either purchase his holding by paying up the balance of 14s. per acre, or may convert his license into a lease extending over seven years, at an annual rental of 2s. per acre, which is also credited to the selector as part payment of the fee-simple. On the expiry of this lease, and due payment of the rent, the land becomes the freehold of the selector. The Crown land sold in 1874 amounted to 531,538 acres, and the extent granted without purchase to 44 acres. Of the former, 49,656 acres were sold by auction. The remainder was selected under the various Land Acts. The total extent sold, from the first settlement of the colony to the end of 1874, was 9,929,388 acres, and the extent granted without purchase was 3,245 acres, making a total of 9,932,633 acres. The fee-simple of the whole of this land had passed to the purchaser. A further extent of land, amounting, at the end of 1874, to about 5,650,000 acres, was in process of alienation under the system of deferred payments, and this too, should the legal conditions be duly complied with, will pass away from the Crown in the course of a few years. Then there is land occupied by roads, the sites of towns, State forests, auriferous pastoral, and timber reserves, and land which is at present useless owing to its mountainous character, or to its being covered with mallee scrub, lakes, or lagoons. Deducting the whole of these lands from the area of the colony, estimated at 56,446,720 acres, the area available for selection at the end of 1874 amounted to nearly 15,000,000 acres.

**Crown land sold in 1874.****Squatters.**

Land, until selected, is held by persons called squatters, who are tenants of the Crown, but can be dispossessed at any moment to meet the wants of the agricultural selector. The rent paid by them is 4s. yearly for each horse or head of cattle that the run can depasture, and 8d. per head for the sheep. The amount received from these sources in 1874 was 125,938l., or at the rate of about 1½d. per acre.

**Land under cultivation in 1875.**

The land under cultivation in 1875 amounted to 1,011,776 acres, of which 332,936 acres were under wheat, 114,921 oats, 129,505 barley, 35,183 potatoes, 119,031 hay, 254,329 green forage. The area under vines was not given. The production, excluding minor crops, was, wheat 4,850,165 bushels, oats 2,121,612 bushels, barley 169,896 bushels, potatoes 124,310 tons, hay 157,261

tons, wine 577,493 gallons. The value of the agricultural produce was estimated at 4,410,435*l.*, the average weight per bushel of the wheat being 61 lbs., oats 40 lbs., barley 51 lbs.

The live stock amounted to 180,254 horses, 241,137 milch cows, 717,521 cattle, 11,221,056 sheep, and 137,941 pigs, and the value of machinery and improvements upon squatting stations to 13,898,434*l.*

The statistics of the other producing interests show that the beer made amounted to 13,653,531 gallons, and that the number of persons employed in manufacture was, males 20,442, females 4,649, the value of the machinery, plant, and buildings being 4,750,000*l.*

The gold raised in 1874 was valued at 4,630,000*l.*, and the other minerals 35,453*l.* The gold coined in the Melbourne branch of the Royal Mint was, in 1874, 1,383,417*l.* The rates of discount vary at from 6 to 7 per cent. for bills under 65 days to 9 per cent. for bills beyond 120. The liabilities of the local banks were estimated in 1874 at 14,105,460*l.*, and their assets to 20,456,852*l.*, the average dividends paid being 11 per cent. The balance at the credit of the 64,014 depositors in the savings banks was 1,617,301*l.*, or an average of 25*l.* 3*s.* 4*d.* per head.

The number of marriages in 1874 was 4,925, or 6·27 per head, which is less than in England, where it is 8·24. The births were 26,800, and the deaths 12,222, or 15·30 per cent. of the population, as against 22·40 in England and Wales. About 12·5 per cent. of all children born die in their first year, as against 15½ per cent. in England and Wales.

The Commission which represented Victoria at the Philadelphia Exhibition was appointed upon the recommendation of a preliminary Commission which had suggested that an Exhibition be held in Melbourne at which the neighbouring colonies should be invited to compete, and that a selection of the exhibits be sent to Philadelphia.

The Commission was appointed under the Great Seal of the Colony in October 1874, and consisted of the gentlemen whose names appear on the page preceding this report.

The terms of the Commission authorised them to hold a preliminary Exhibition at Melbourne, to unite the people of Victoria and the adjacent colonies and countries to send contributions and to make a selection therefrom of such commodities as might be judged, by competent persons, the most suitable for the purpose of affording an illustration of the resources of the Colony at the Exhibition at Philadelphia.

The Commission went energetically to work to carry into effect the objects set down in their instructions, and obtained from the Trustees of the Public Library, National Museum, and Picture Gallery permission to occupy the Great Hall, the Rotunda, and the various annexes upon condition of erecting a new building to be eventually available for a lecture hall and laboratory.

Great assistance was given by the various Departments of the Government. The Commission received from the Hon. the Commissioner of Railways, free passes for officers when upon duty, and free transit for all goods intended for exhibition; from the Commissioner of Customs leave to receive all foreign goods duty free, until the close of the Exhibition, when they were allowed to be re-exported as if they had been in bond; and from the Postmaster, permission to forward letters and telegrams free. A similar concession was made by the Governments of New South Wales, South Australia, and Queensland. The Melbourne and Hobson's Bay Railway Company displayed the same liberality as the Government line; and the various steamboat companies and shipowners trading to the port, made large reductions in the ordinary rates for freight in favour of goods intended for exhibition. Probable exhibitors in Victoria and the neighbouring Colonies were communicated with by letter and circular, and an active canvass was made. The manufacturers and producers of Victoria responded nobly to the call made upon them, and notwithstanding the comparatively short time which had elapsed since the Exhibition of 1872-73, the Commissioners received the most gratifying assurance of support; assurances which, as the event showed, were more than realised. Indeed, the great success of the late Exhibition may fairly be attributed to the energy and enterprise displayed by

Live stock.  
Value of  
machinery, &c.

Beer.

Gold raised in  
1874.  
Other minerals  
Banking.

Marriages in  
1874.  
Births and  
deaths.  
Per-centage of  
infant mortality.

Commission for  
Philadelphia  
Exhibition.

Terms of Com-  
mission.

Preliminaries  
of executive  
work.

Assistance given,

by Governments,

by Railways  
[Government and  
private], and by  
steamboat com-  
panies.

Victorian exhibitors.

the Victorian exhibitors, for while, on the occasion of the first Intercolonial Exhibition in 1866-67, they were, in numbers, in space occupied, and in the variety of their exhibits, not more than one-half of the whole, they were at the recent Exhibition four times as numerous as all the rest put together. No change took place in the plan of the Commissioners after the publication of their first prospectus on January 19, 1875, except that in consequence of the Philadelphia Exhibition having been postponed from April to May, they were enabled to delay their opening from August to September, thus giving more time to the exhibitors and ensuring finer weather, and that the large increasing and gratifying demands upon their space compelled them to apply to the Trustees of the Public Library for additional accommodation, an application which was cheerfully met by placing the Sculpture Gallery at the disposal of the Exhibition authorities. The Exhibition was opened on Thursday, September 2, by Sir William Stawell, Acting Governor of the Colony, in the presence of a large concourse of people.

Opening of exhibition.

Sir Redmond Barry, the President of the Commission, delivered an address reciting the various steps taken by himself and colleagues, and giving some interesting statistics.

Australasian exhibitors.

The exhibitors included persons from the adjacent colonies of New South Wales, South Australia, Tasmania, New Zealand, Queensland, and Western Australia, and the three first-mentioned colonies were represented by duly appointed Commissioners. The Empire of Japan and the British Colony of Singapore had also sent large and interesting collections, and the Government of the former nation had despatched to Melbourne two Commissioners and a European Secretary, who were accompanied by two students from the Agricultural College of Yeddo.

Japan and Singapore.

The amount of space applied for and occupied, showed a gratifying increase over former Exhibitions.

The figures were as follows :—

Space occupied by colony in various exhibitions from 1854.		Amount of space occupied.		Number of Exhibits.
	1854	-	19,000 feet	- 428
	1861	-	19,000 feet	- 703
	1872	-	32,000 feet	- 1,748
	1866	-	56,240 feet	- 3,442
	1875	-	78,000 feet	- 4,991

Progress since 1854 in manufactures.

The difference in the character of the exhibits was even more marked than the increase in the number. The first Exhibition held in 1854 consisted almost exclusively of imported articles. In that of 1861 there were a number of raw products and specimens of a few of the more simple and primitive industries. Colonial manufactures first began to assume a prominent position at the Exhibition of 1866, and both in 1872 and 1875 the skill, ingenuity and taste of the Victorian workmen, artisans, and artists were the most remarkable feature in the Exhibition.

The following statement of the progress made by the colony since the previous Exhibition held immediately prior to the London and Vienna Exhibitions of 1873, was made by the Premier of the colony at a banquet given upon the opening day by the Mayor of Melbourne, and is derived from official sources :—

General progress.

"The last Exhibition was opened on the 6th November 1872. Since that date at least 50,000 have been added to the numbers of our population, and 75,000 to the acres in cultivation. The revenue has increased by 400,000*l.*; the shipping inwards and outwards has increased by more than 200,000 tons; the imports have swelled from 12,340,000*l.* in the year prior to that of the last Exhibition to nearly 17,000,000*l.*, or by over 4,500,000*l.* sterling; and the exports have increased, in the same period, from 14,500,000*l.* to 15,400,000*l.*, or by 900,000*l.*, and this notwithstanding a falling off of 2,500,000*l.* sterling in the exports of gold. The letters passing through the Post Office have increased by 4,000,000, and the newspapers by 1,700,000. Messages by electric telegraph have increased by 164,000; deposits in savings' banks by 500,000*l.*, and this notwithstanding the high rate of interest offered by building societies and other competing institutions. Children at school have increased by

73,000; manufactories have increased from 1,745 to 2,109, or by 364; the hands employed in manufactories have increased from 19,294 to 28,026, or by 8,732; and the capital invested in manufactories, so far as it is represented by the value of lands, buildings, machinery, and plant, has increased from 4,725,425*l.* to 6,798,820*l.* or by 2,073,395*l.* At the same time crime has diminished, as is evident from the fact that the persons committed for trial have fallen off in three years from 781 to 694, and not one arrest has been made for smuggling in the past three years."

The Melbourne Exhibition of 1875 was kept open for seventy-six days, a prolonged period when the population of the colony, which does not exceed 850,000 is considered. The sum taken at the doors was 8,373*l.* and the paying attendance 240,000. The number of exhibitors was 1,060, of whom 805 were from Victoria, and the number of prizes granted was thirty-six (36) special silver medals, thirty-two (32) silver medals, two hundred and seventeen (217) medals, one hundred and eighty-six (186) first-class certificates, ninety-eight (98) second-class certificates, thirty-five (35) third-class certificates, and eleven (11) fourth-class certificates; total 615.

Details of Melbourne exhibition.

The medal adopted by the Commissioners in Melbourne represented the globe divided from north to south, displaying the new world of America, Australia, and the Pacific Islands, supported by portrait figures of Christopher Columbus and Captain Cook, while upon the reverse is the quotation from Seneca which has been thought prophetic of the discovery of America, "*Ingens pateat tellus nec sit terris ultima thule.*"

Medal.

As the system adopted for deciding on the exhibits gave general satisfaction, it is as well to mention it here.

The contents of the Exhibition were divided into 26 departments, to each of which a separate jury was assigned; each jury was asked to specify the degrees of merit possessed by the exhibits in their own department, and to say which deserved a first-class, which a second, which a third, and which a fourth prize. The Commissioners reserved to themselves the right of deciding in each case what should be the highest prize in each group.

Juries.

The punctuality observed by the exhibitors in bringing in the objects displayed, and their diligence in arranging them in position, enabled the jurors to undertake their duties before the admission of the public, and to examine the exhibits thoroughly at their leisure, undisturbed by the numberless distractions and interruptions which occur when the buildings are thronged with visitors. It allowed them, moreover, in most instances, indeed in all except where further examination or reference was necessary to determine upon the relative excellence of the matters submitted to their judgment, to declare which were of the highest order of merit, and thus to afford to successful exhibitors the satisfaction of an award in their favour declared before the opening day.

Punctuality displayed by exhibitors.

By this means two leading aims of such expositions were achieved, the unlearned visitor was at once led up to the things most deserving of his attention, and the exhibitor enjoyed for the longest period an advertisement of the excellence of the object to the production of which he had applied his capital, skill, and labour, while ample time was left for the jurors to mature their opinions, and prepare reports well thought out.

The Melbourne Exhibition closed on November 16th, and on the 3rd of December the Commissioners gave up possession of the buildings occupied by them. On the 7th December the medals and other awards were distributed, and the business of the Melbourne Exhibition was finally wound up.

Close of exhibition.

The great bulk of the articles intended for exhibition at Philadelphia were forwarded from Melbourne to New York by the "*Skerryvore*" in December. Smaller shipments were made by the Suez mail steamer of December, and by the March and April mail steamers via San Francisco.

Dispatch of goods for Philadelphia by sundry routes. Fruits and grain.

These latter brought grain and fruit of the season of 1876. It is satisfactory to state that the apples and pears dispatched by way of San Francisco arrived in excellent condition and largely engaged the attention of pomologists. It was conceded that the specimens were the very finest of their kinds, and they arrived in excellent condition.

To the collection of timber from Victoria a large and valuable addition was made by numerous samples sent from the Botanical Gardens, Kew, under the

authority of Her Majesty's Government, and some articles the property of the Victorian Government in London under the charge of the Agent-General were added to the general exhibition.

**Number of exhibits.** The number of exhibits sent by Victoria was 3,200, they occupied 3,410 feet of floor and 4,652 feet of wall space in the main hall, 350 feet of floor space in the agricultural hall, and 100 feet of floor space in the horticultural hall, and the value inclusive of those the property of the Commissioners, and of those forwarded by private exhibitors was estimated at 7,000*l*.

**Voyage of "Skerryvore."** The voyage of the "Skerryvore" was marked by a series of disastrous incidents, and although the average passage from Melbourne to New York does not exceed 100 days, it was not until May 6th, 149 days after leaving Melbourne, that the ship arrived in port. During the latter part of the passage she sprung a leak, and the greater portion of the cargo was injured by salt water to an amount in value estimated at 1,600*l*. An expenditure of nearly 1,000*l*. was incurred in restoring those of the exhibits capable of being made suitable for exhibition. Some of the most valuable objects were, however, irreparably damaged, and were sold, and the Commissioners were thus prevented from displaying some of the most interesting articles entrusted to their care.

**Outlay authorised by Government.** The accounts for the Victorian Commission will show a disbursement authorised by the Government of Victoria exceeding 8,800*l*., a sum which indicates a desire on the part of the Executive and Parliament that the efforts of exhibitors should be supported in a liberal spirit.

**Resident Commissioners at Philadelphia.** The Commission was represented at Philadelphia by the President, Sir Redmond Barry, K.C.M.G., by the Secretary, Mr. G. C. Levey, and by two Commissioners, Mr. M'Ilwraith and Mr. M'Intyre. The other Commissioner, Mr. J. G. Francis, was not able to avail himself of the honour of assisting at Philadelphia. Mr. Levey, the Secretary, on his way to America through Europe, was instrumental in procuring in Italy some highly interesting objects, including a group of statuary by Summers.

**General commendation of Victorian Court.** The Commissioners direct attention to the encomiums passed upon the Victorian Court by the press and people of America. They present to the Government and people of Victoria their respectful congratulations upon the excellent effect produced on their fellow subjects in the Dominion of Canada, and on the citizens of the United States by the large and varied display of the products and manufactures of their country, forwarded to the Exhibition; upon the good will which the Exhibition made by the various sections of the British Empire has engendered amongst the different branches of the Anglo-Saxon race, and upon the knowledge of the resources, ingenuity, and enterprise, of the people of Victoria, which has been spread amongst the inhabitants of the great American continent.

## CATALOGUE OF PRODUCTIONS sent to the PHILADELPHIA INTERNATIONAL EXHIBITION 1876.

*P.—This letter indicates exhibits receiving awards.*

**COLLECTION OF ROCKS, MINERALS, and FOSSILS, illustrative of the GEOLOGY, MINERALOGY, and MINING RESOURCES OF VICTORIA, exhibited for and on behalf of the GOVERNMENT, by R. BROUGH SMYTH, F.G.S., F.L.S., Assoc. Inst. C.E., Secretary for Mines and Chief Inspector of Mines for the Colony.**

Older Igneous or Plutonic Rocks. Granites, porphyries, &c.

Newer Igneous or Volcanic Rocks. Older Basalt. (Age between eocene and older pliocene tertiary).

Newer Basalt. (Age from pliocene tertiary to recent).

Aqueous Rocks. Lower Palæozoic. Lower Silurian. (Including rocks of this age metamorphosed by contact with granite and other igneous rocks).

Upper Silurian. (Including rocks of this age metamorphosed by contact with granite, &c.)

Upper Palaeozoic.  
 Mesozoic—Carbonaceous.  
 Tertiary.  
 Collection of Mineral Specimens.  
 Economic Collection. Auriferous Quartz.

#### FAC-SIMILES OF GOLD NUGGETS FOUND IN VICTORIA.

The "Beauty" nugget weighed 242 ozs. It was discovered at a depth of 9 ft. from the surface, in Kangaroo Gully, Bendigo, in the year 1858. The gold was 22·2½ carats fine.

The "Platypus" nugget weighed 377 ozs. 6 dwts. It was found in Robinson Crusoe Gully, Bendigo, in a pillar of earth in a deserted claim. The claim was situated in shallow alluvium, and the nugget was discovered in March 1861. The gold was 22·1½ carats fine.

The "Viscount Canterbury" nugget was found in John's Paddock, Berlin Diggings, at a depth of 15 ft. from the surface, on the 31st May 1870. It weighed 1,105 ozs. The gold was 23·3 carats fine.

The "Schlemm" nugget was found at Dunolly on the 11th July 1872, at a depth of 3 ft. beneath the surface. It weighed 538 ozs. and is estimated to contain 60 ozs. of quartz.

Nugget (not named) found in Broomfield's Gully, Creswick, on the 8th August 1872. It weighed 24 ozs. 3 dwts., and was got at a depth of 100 ft. below the surface.

The "Kum Tow" nugget weighed 718 ozs. 5 dwts. It was found on the 17th April 1871 in Catto's Paddock, Berlin Diggings, at a depth of 12 ft. 6 in. below the surface. It was found by a party of Chinamen. The gold was 23·3 carats fine.

The "Viscountess Canterbury" nugget was found on the 3rd October 1870 at Berlin. It was discovered at 6 ft. 6 in. beneath the surface, and weighed 884 ozs. 10 dwts. The gold was 23·2½ carats fine.

The "Crescent" nugget was found on the 2nd April 1872 at a depth of 2 ft. beneath the surface. It weighed 176 ozs. 8 dwts., and was discovered at Berlin.

Nugget (not named), found at Creswick, in the Key Company's mine. It weighed 32 ozs., and was found in January 1871.

The "Oldham" nuggets, found at Turton's Creek, in April 1873. They weighed respectively 2 ozs. and 36 ozs., and were got at a depth of 2 ft. beneath the surface. The gold was 23·3 carats fine.

The "Spondulix" nugget was found in November 1872, at Eureka Gulley, Jordan's, near Dunolly. It weighed 130 ozs., and was estimated to contain 29 ozs. of quartz. Discovered at 8 ft. beneath the surface in a quartz vein.

The "Alma 1" nugget was found on the 14th April 1873, at Maryborough. It weighed 125 ozs. It was discovered at 120 ft. beneath the surface. The gold was 23·1 carats fine.

Nugget (not named) found in Broomfield's Gully, Creswick, on 12th August 1872. It weighed 46 ozs. 15 dwts., and was got at 100 ft. in depth.

Nugget (not named) found at Creswick in the Red Streak Lead, on the 31st August 1872. It was discovered at 180 ft. below the surface, and weighed 30 ozs. 1 dwt.

Nugget (not named) found at Buninyong, on the 21st July 1875. It was discovered at 73 ft. below the surface, and weighed 58 ozs. 5 dwts. The gold was 23·4 carats fine.

Nugget (not named) found at Upper Boggy Creek, on the 9th September 1873. It was discovered at 4 ft. below the surface, and weighed 29 ozs.

The "Needful" nugget was discovered at 12 ft. beneath the surface, in Catto's Paddock, Berlin Diggings, on the 10th May 1871. It weighed 246 ozs. 16 dwts., and the gold was 23·3 carats fine.

The "Alma 2" nugget was found at Maryborough, on the 14th April 1873, at 120 ft. beneath the surface. It weighed 15 ozs. The gold was 23·1 carats fine.

The "Eldorado" nugget was found at Smythesdale on the 26th August 1873, at 155 ft. beneath the surface. It weighed 170 ozs.

The "Lothair" nugget found at Clunes, at 307 ft. beneath the surface, on the 11th July 1875. It weighed 77 ozs. 6 dwts. The gold was 22·2½ carats fine.

Nugget (not named) found at Sandhurst, in Crusoe Gully, on the 18th July 1875. It was discovered at 3 ft. beneath the surface, and weighed 46 ozs.

Nugget (not named) found at Creswick, at 150 ft. below the surface, on the 28th April 1874. It weighed 53 ozs. The gold 23·3 carats fine.

Nugget (not named) found at Ballarat in the Golden Reef Claim, at 200 ft. beneath the surface. It weighed 31 ozs. 5 dwts.

The "Welcome" nugget was found on the 11th June 1858, at 180 ft. beneath the surface, Bakery Hill, Ballarat. It weighed 2,195 ozs.

#### Economic Minerals.

- ▶ Acadia Catherine Gold Mining Company, Sandhurst.—Specimens of Golden Stone, from the Acadia Catherine Mine.

- ▶ Bleasdale, Rev. J. L., D.D., St. Patrick's College, Melbourne.—Collection of Gems and Precious Stones, consisting of Diamonds, Blue Sapphires, Oriental Emeralds (the green sapphire), Rubies, Aqua-marines, Topazes, Spinels, Beryls, Opals, Garnets, Tourmalines, &c., &c., collected by exhibitor.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Facsimiles of Nuggets found in Victoria.

Costerfield Gold and Antimony Mining Company. Office, 52, Elizabeth Street, Melbourne.—Antimony Ore.

Hanckar, J. H. H., 52, Bourke Street East, Melbourne.—Block of Nickel Ore, from the Boa Kaine Mine, New Caledonia.

M'Gie, James, & Co., Melbourne.—Nickel Ore.

Shenandoak Gold Mining Company, Sandhurst.—Gold-bearing Quartz, from stope at the 890 feet level. Reef, 7 ft. wide. This specimen was in one block, and split up to disclose gold.

- ▶ Smyth, R. Brough, Department of Mines, Melbourne.—Geological Maps.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Coal.

Mining Department of Victoria, Melbourne.—Coal.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Sawn Slate. Block of Granite. Specimens of Polished Marble.

Mansfield Shire Council, Mansfield.—Slabs of Polished Marble. Hewn Sandstone.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Limestone, from Major Plains.

Arthur and Dogherty, New Zealand.—Sample of Lithographic Stone.

Lewis and Whitty, Charles Street, Fitzroy.—Knife Polish.

Hattersley, J., Yackandandah.—Aerated Waters.

Lyon, George, Spring Creek, Beechworth.—Lemonade. Soda Water. Ginger Ale.

Rowlands and Lewis, Ballarat and Melbourne.—Tonic Water. Potass Water. Soda Water. Lithia Water. Seltzer Water. Ginger Ale.

Metallurgical Products.—Class 118.—Lead, zinc, antimony, and other metals, the result of extractive processes.

- ▶ Bright Brothers & Co., Little Flinders Street West, Melbourne.—Star Antimony in ingots.

- ▶ Costerfield Gold and Antimony Mining Company. Office, 52, Elizabeth Street, Melbourne.—Sulphide of Antimony. Refined sulphide of Antimony. Crude Antimony of Commerce. Oxide of Antimony. Pure Regulus of Antimony, reduced from the oxide.

- ▶ Hodgson, Richard, Noon Street, Collingwood.—Star Antimony. Pigs of Lead. Blocks of Tin, all smelted in the colony.

On the Continent of Europe the arborial, health-producing and medicinal products of the *Eucalyptus globulus*, or Blue Gum tree, have been so much enlarged upon in consequence of having only this species in cultivation, that the whole of the *Eucalyptus* products have been classified as emanating from this one species; it is necessary therefore to point out that such is not the case.

- ▶▶ Bosisto, Joseph, Bridge Road, Richmond.—Chemical and Pharmaceutical Preparations obtained from the *Eucalyptus* and other Indigenous Vegetation, prepared and exhibited by Joseph Bosisto, Richmond, Melbourne, President of the Pharmaceutical Society of Victoria, by whom the *Eucalyptus* preparations were first introduced, both in Australia and in Europe:—

#### EUCALYPTUS VEGETATION.

Essential Oil, *Eucalyptus globulus* (Blue Gum). Tonic, stimulant, antiseptic, and anthelmintic. A small dose promotes appetite, a large one destroys it. In stronger doses of 10 to 20 minims, it first accelerates the pulse, produces pleasant general excitement (shown by irresistible desire for moving about), and a feeling of buoyancy and strength. Intoxicating in very large doses, but unlike alcohol or opium the effects are not followed by torpor, but produce a general calmness and soothing sleep. A strong cup of coffee will at once remove any unpleasantness arising from an overdose. Anthelmintic.—By enema, 30 to 60 minims in mucilage of starch. Internally—Dose, 3 to 5 minims in gum mucilage, syrup or glycerine.

Eucalyptol, *Eucalyptus globulus* (Blue Gum). For inhalation in bronchial and throat affections. Obtained from the essential oil and is a homologue of camphor. Quantity employed:—From half to one teaspoonful with half a pint of hot water in the inhaler.

Eucalyptic Acid, ordinary strength } Volatile obtainable by fractional distillation,  
 Eucalyptus globulus (Blue Gum) } most abundant in the Red and Blue Gum  
 Eucalyptic Acid concentrated - } species.

Liquor Eucalypti globuli, Eucalyptus globulus (Blue Gum). Antiperiodic. The tonic or bitter principle obtained from the leaves of the tree in an amorphous condition. An ague remedy. It appears to counteract malaria without exerting the prejudicial effects of quinine on the nervous system. For Ague and Dengue Fever, 30 to 60 minims in half a wine-glassful of mucilage and water, or glycerine and water, with the occasional addition of two minims of Eucalyptol every two or three hours during the paroxysms of Ague. As a general tonic, 20 to 30 minims three times a day. Incompatibles.....The Mineral Salts.

Tinct. Eucalypti Globuli. Stimulant, tonic, antiperiodic and antiseptic. Dose, 20 to 30 minims.

Pulv. Eucalyptus Globulus Folia. Antiseptic, Cataplasma.

Cigarettes, Eucalyptus globulus (Blue Gum). Disinfectant employed in bronchial and asthmatic affections.

Essential Oil, Eucalyptus amygdalina odorata (Peppermint Gum). Rubefacient and disinfectant. This oil is generally known as the "Eucalyptus Oil," employed externally in rheumatic affections, and in the manufactories chiefly for perfumery, soaps, &c. An excellent and very agreeable disinfectant if mixed with sawdust in the proportion of four ounces of oil to the bushel.

Ointment of Eucalyptus odorata. Employed in fœtid suppurations and indolent wounds.

Red Gum. (From Eucalyptus rostrata, of Victoria.) The delicate mucilaginous astrigent possessed by this species of the Eucalypti renders it more effective than the Acacia catechu in all cases of dysentery, diarrhœa, and throat affections. Generally employed in the form of a syrup.

Essential Oil, Eucalyptus oleosa (Mallee Scrub). Employed chiefly in the manufacture of oil and spirit varnishes. Varnish containing this oil in the place of spirits of turpentine is said neither to bloom nor crack. It is a perfect solvent of india-rubber without heat.

India-rubber with the Essential Oil, Eucalyptus oleosa (Mallee Scrub). Showing the two in combination.

Potash, Eucalyptus oleosa (Mallee Scrub). Obtained from the scrub after being deprived of its volatile oil.

Essential Oil, Eucalyptus rostrata (Red Gum of Victoria).

Essential Oil, Eucalyptus sideroxylon (Ironbark Gum)

Essential Oil, Eucalyptus persicifolia (Peach Gum)

Essential Oil, Eucalyptus citriodora (Sweet-scented Gum, Queensland)

Essential Oil, Eucalyptus fissilis (Messmate)

Essential Oil, Eucalyptus Stuartiana (Apple tree Gum)

Essential Oil, Eucalyptus goniocalyx (White Gum)

Specimen Samples  
 showing the variety of  
 aroma existing in the  
 Eucalypti.

#### INDIGENOUS.

Essential Oil, Atherosperma moschatum (Native Sassafras), Diaphoretic, diuretic and sedative. Obtained from the bark, it exerts a specific lowering influence on the heart's action.

Atherospermine, Atherosperma moschatum (Native Sassafras). An alkaloid obtained from the bark. Tonic.

Salts of Lime, Atherosperma moschatum (Native Sassafras). Obtained from the bark.

Bark, Atherosperma moschatum (Native Sassafras).

Essential Oil, Melaleuca ericifolia (Teatree).

Resin, Pinus, callitris (Murray Pine). Obtainable in quantity from under the pines growing on ridges in the Mallee country.

Rosin, Xanthorrhœa Australis (Grasstree of Australia). Soluble in spirit, of a deep amber colour, obtainable in large quantities; employed for staining wood to imitate cedar.

#### NON-INDIGENOUS.

Opium, Papaver somnifera (Sleeping Poppy). Cultivated in Victoria, yielding ten per centum of Morphia.

Morphia, from the Victorian Opium.

Capsules, Papaver somnifera (Sleeping Poppy). Specimens of growth.

Essential Oil, Mentha piperita (English Peppermint). Cultivated in Victoria, and distilled by exhibitor four years ago.

- ▶ Hood & Co., Elizabeth Street, Melbourne. — Pharmaceutical preparations, essential oils and chemicals.
- ▶ Commissioners for Victoria for the Philadelphia Exhibition.—Chemicals.
- ▶ Fitts, Charles, & Sons, 67, Cecil Street, Emerald Hill.—Neatsfoot Oil, Trotter Oil.
- ▶ Kitchen & Sons, Little Flinders Street West, Melbourne.—Stearine Candles, Large Carriages Candles.
- ▶ Borthwick, Alexander, 35, Market Street, Melbourne. — Varnishes, manufactured by the Victoria Varnish Company; Anti-fouling Composition for Ships' Bottoms, patented by exhibitor; Cast Iron Pedestal Pillars, enamelled by exhibitor's process; Anticorrosive Paint.
- ▶ Bowman, John S., 31, Russell Street, Melbourne.—Colonial Crayons, made principally from colonial clays, containing 600 shades.
- ▶ Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Crayons.
- ▶ Lewis & Whitty, Charles Street, Fitzroy.—Blacking.
- ▶ Hogg, S. P., & Co., Collins Street West, Melbourne.—Curry Powder.
- ▶ Lewis & Whitty, Charles Street, Fitzroy.—Perfumed Hair Oil, Culinary Essences, Curry Powder.
- ▶ Perry, Hunter, & Co., Forest Street, Sandhurst.—Varieties of Safety Fuse.

#### CERAMICS, POTTERY, PORCELAIN, &C.

Barningham & Lacy, Barkly Street, Brunswick.—Red Building Bricks, White Pressed and Moulded Bricks.

Nolan, Luke, Gillbrook Pottery, Brunswick.—Stoneware Draining Pipes.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Fireclay Crucibles, Encaustic Tiles, Trusses, Vases, &c.

Adams, R. T., Prince's Bridge, Melbourne.—Earthenware Household and Office Filters, 10 gallons, 6 x 3; Syphon Tank Filter, with 12 ft. of tube; High-pressure Copper Filter, inside silvered, self-cleansing, for public institutions, schools, &c., made expressly for the Yan Yean and other Waterworks.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Earthenware and Pottery.

Nolan, Luke, Gillbrook Pottery, Brunswick.—Bronze Vases. Stone Porous Jugs. Patent Damp-proof for floor ventilation.

Ferguson and Urie, Collins Street East, Melbourne.—Stained Glass for windows.

Gledhill, Melbourne.—Glass Bottles.

Melbourne Glass Bottle Works Company, Emerald Hill.—Glass Bottles.

Mount & Co., Graham Street, Emerald Hill.—Assortment of Glassware.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Glassware.

Alcock & Co., Russell Street, Melbourne.—Blackwood Billiard Table with carved legs, Huon-pine twist mouldings and pannels. Billiard Cues, Rests, and Balls. Cue Stand. Combination Marking Board. Cue Stand, with specimens of spiral twist work in Australian wood. Console Table.

Carr and Sons, 128, Spring Street, Melbourne.—Inside Venetian Blind, with check action. Wire Blind. Spanish and Florentine Blinds. Spring Roller Blind. Dwarf Blind. Window Sash, with Venetian shutters, &c.

Davis, J., Richmond.—Davis's Patent Window Sash.

Hodgson Brothers, View Place, Sandhurst.—Patent self-acting Venetian Blind. Spring Roller Blind. The special feature in this exhibit is the new and improved method of painting the Venetian Blind, it being superior and more lasting than the usual method of treating the mineral green used for painting.

McEwan, James, 361, Spencer Street, Melbourne.—Eight-foot Sideboard, made of Picked Richmond Cedar. The carving enrichments consist of nine carved figures, the centre ornament on glass back represents the head of Minerva.

- ▶ Muschialli, Louis, 102, Collins Street East, Melbourne.—Pier Glass. Console Table.

Baker, John, Emerald Hill.—Baker's Patent Safety Steps.

Wiegmann, August, 45, Post Office Place, Melbourne.—Basketware Cradles. Basketware Perambulators. Basketware Chairs. Basketware Flower Stands. Baskets.

Walker, A. R., 40, Latrobe Street West, Melbourne.—Reflector Gas Cooking Stove. Reflector Gas Cooking Stove with Boiler.

Shaw, Alfred & Co., 13, Little Collins Street West.—Millet Brooms and Whisks.

Guthrie, G. D., Epsom, Sandhurst.—Collection of Pottery Ware in cane, rocking-ham, brownware, granite, &c., consisting of bread pans, butter jars, cheese dishes and pans, cream pots, churns, jam pots, jelly jars, pudding bowls, baking dishes, jugs, jars, pipkins, wicker, jars and bottles, teapots, gallon bottles, gingerbeer bottles, kegs,

water filters, blacking bottles, footpans, footwarmers, spittoons, fowl fountains, grate backs, &c.

Bogle, Andrew, & Co., 21, Flinders Street East, Melbourne.—The Household Help, —Bogle's Patent Boot and Shoe Brushing and Cutters' Polishing and Sharpening Machine.

Pausacker, Evans, & Co., 8, Lonsdale Street West, Melbourne.—Registered-edge Solid Leather Portmanteaus, of Colonial make, leather, and workmanship.

Draper and Sons, 83, Bourke Street West.—Patent Earth-closets and Fittings.

#### YARNS AND WOVEN GOODS OF VEGETABLE OR MINERAL MATERIALS.

Donaghy, Michael, Rope Works, Geelong.—Manila Flat Rope. Italian Lash Line. Deep Sea Line. Ham Twine.

Miller, James, & Co., 61, Flinders Street, Melbourne.—European and Manila Rope, Deep Sea and Whale Line.

McPherson, Thomas, 205, Bourke Street West, Melbourne.—Cornsacks. Wool-packs. Sugar Bagging.

Barwon Woollen Mill Company, Geelong.—Tweeds, manufactured at the Barwon Woollen Mill Company, Geelong.

Victoria Woollen Cloth Company, Geelong.—Woolens.

Gray, Alexander, & Co., Albion Woollen Mills, Geelong.—Plain and fancy Tweeds, manufactured at the Albion Woollen Mills, Geelong.

Ballarat Woollen Company, Ballarat.—Shawls; Tweeds; Blankets.

Barwon Woollen Mill Company, Geelong.—Blankets, manufactured by the Barwon Woollen Mill Company, Geelong.

Botanic Gardens, Directors of, Melbourne.—Woollen Cloth and Silk, dyed with bark of *Laportea gigas*, the Tree Nettle. Queensland and New South Wales. Prepared by W. R. Guilfoyle (A 5). Woollen Cloth and Silk, dyed with husks of *Sterculia diversifolia*, the Native Wattle Tree, Victoria. Prepared by W. R. Guilfoyle (A 6). Woollen Cloth; also piece of Silk, dyed with bark of *Pimelia axiflora*, Currijong of the aborigines, Victoria. Prepared by W. R. Guilfoyle (A 4). Woollen Cloth; also piece of Silk, dyed with bark of *Dais continifolia*, South Africa. Mordanted with acetate of iron. Prepared by W. R. Guilfoyle, Director of Melbourne Botanic Gardens.

Zoological and Acclimatisation Society, Melbourne.—Angora Goat's Hair, grown at Sir Samuel Wilson's Mount Bute Estate, shorn from the Angora flock belonging to the above Society.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Silk Cocoons, from the Acclimatisation Society, Victoria. Silk Cocoons, from Mrs. Bladen Niell. Cultivated Silk, in cocoons and hanks, also bleached, dyed, and worked upon llama.

Timbrell, Ann, Plenty Road, Collingwood.—Cocoons produced by silkworms from Japan, France, Italy, and Greece. Silk (raw material in hank). Victorian Silk, worked on Brussels net.

Victoria Ladies' Sericulture Company (Limited), Mount Alexander, Castlemaine.—Silk, desiccated and pierced Cocoons.

Ford Brothers, 421, King Street, Melbourne.—Pith Hats, in Felt, Silk, Merino, &c.

Rosier, John, 46, Swanstone Street, Melbourne.—Boots and Shoes.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Myall Pipes; Rouleau Boxes, made of myall wood.

Ford Brothers, 421, King Street, Melbourne.—Pith Sunshades for horses.

De Richelieu, Madam F., Union Street, Windsor.—Ornaments made from fish scales, &c.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Address Case of Inlaid Leather. Made by J. W. Evans.

Botanic Gardens, Director of, Melbourne.—Paper made from bark, stems, and leaves of Trees, Plants, and Shrubs, found and growing in Victoria—*Broussonetia papyrifera* (Paper Mulberry Tree); *Salvia Canariensis*; *Dais continifolia*; *Eucalyptus obliqua* (Stringybark); *Eucalyptus fissilis* (Messmate); *Abutilon mollis* (Soft-leaved Abutilon); *Abutilon venosum* (Veined Lantern Flower); *Pimelia axiflora* (Currijong); *Commersonia Fraseri*, Queensland (Lye Plant); *Pittosporum crassifolium* (Thick-leaved Pittosporum); *Pipturus propinquus* (Queensland Grasscloth Plant); *Melaleuca ericifolia* (Common Tea Tree); *Melaleuca genistifolia* (Broom-leaved Tea Tree); *Sterculia diversifolia* (Victorian Bottle Tree); *Sterculia acerifolia* (Flame Tree); *Böhmia nivea* (Chinese Grasscloth Plant); *Sida pulchella* (Victorian Hemp); *Sida retusa* (Queensland Hemp); *Melaleuca squarrosa* (Victorian Nettle).

Paper made from stems of *Urtica incisa* (Victorian Nettle); *Ehrharta tenacissima*; *Carex appressa*; *Carex pseudo-cyperus*; *Isolepis nodosa*; *Juncus pauciflorus* (Few-flowered Rush).

- Paper made from stems and leaves of *Gahnia psittacorum*, var. *erythrocarpum*; *Lepidosperma elatius* (Tall Sword Rush); *Cordylina indivisa* (Tall Palm Lily); *Phormium tenax* (New Zealand Flax); *Gynerium argenteum* (Pampas Grass); *Arundo conspicua* (Plume Grass); *Fourcroya gigantea* (Giant Lily); *Cyperus* sp.; *Juncus maritimus* (Coast Rush); *Juncus vaginatus* (Small Sheathed Rush); *Juncus vaginatus* (Large Sheathed Rush); *Lepidosperma gladiatum* (Coast Sword Rush); *Typha angustifolia* (Native Bulrush); *Scirpus fluviatilis*; *Marica Northiana*; *Xerotes longifolia* (Native Tussock Grass); *Pandanus utilis* (Screw Pine); *Cyperus lucidus*; *Conferva* sp. (Swamp Moss); *Dianella latifolia*; *Caryota urens* (Jaggery Palm).
- Fibres of different trees and plants.
- Gums, resins, vegetable fat, and caoutchouc.
- Ramsden, Samuel, Prince's Bridge, Melbourne.—Papers.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Aboriginal Weapon. Native Axe. Victorian Aboriginal Implements and Weapons.
- Stanway, South W., Yarra.—Models of chairs for Invalids.
- Danks, John, Bourke Street West, Melbourne.—Steam Valves. Steam Cocks. Check Valves. Suet Lubricators. Injectors. Sluice Valves. Roscoe's Lubricators. General Brass Foundry.
- McIlwraith, John, Little Collins Street East, Melbourne.—Tinned Composition Gas Pipe, hydraulic pressed. Pure Victorian Tin Tube, hydraulic pressed.
- Rothwell, Wade, 52, Bank Street West, Melbourne.—Lady's Saddle. Gentleman's Saddle. Set of Buggy Harness. Green Hide Girth. Lady's Riding Bridle. Gentleman's Hunting Bridle. Stock Whips, myall-wood handles.
- Glenister, W. A., Mercer Street, Geelong.—1½-in. Colling's Patent Axletree Arm. 1½-in. Mail Patent Axle. 1½-in. Improved Half-patent Axle. 1½-in. Common Nut Axle. Model of Colling's Patent Crank.
- Stoneman, Alfred, Stephenson Street, Richmond.—Buggy Side Springs. Elliptic Side Springs. Spring-cart Side Springs.
- Stevenson and Elliott, King Street, Melbourne.—Landau, with patent hood, patent steps, and patent fittings for inside seats.
- Educational Department of Victoria, Melbourne.—Photographic Views of State Schools in Victoria, viz.: Golden Point, Ballarat; Mount Pleasant, Ballarat; Redan, Ballarat; Sebastopol, Ballarat; Golden Square, Sandhurst; Gravel Hill, Sandhurst; Sandhurst, Daylesford, Maryborough, North Clunes, Carisbrook, Mortchup, Talbot; Mount Doran, Cardigan, North Eaglehawk, Maldon, Beechworth, Buhingyong Coburg, Sandridge, North Ashby, Geelong; Swanston Street, Geelong; George Street, Fitzroy; North Fitzroy; Brighton Street, Richmond; Yarra Park, Richmond; Brighton, North Prahran, Hotham, Emerald Hill, St. Kilda, Gold Street, Collingwood; Latrobe Street, Melbourne.
- Victorian Asylum and School for the Blind, Melbourne.—Objects, the work of the Pupils of the Victorian Asylum and School for the Blind.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Collection of books printed in Melbourne. Official Catalogues of the Victorian Intercolonial Exhibition of 1875. The Land Acts of Victoria 1869 to 1873.
- Ferres, John, Government Printer, Melbourne.—Reports and Statistics from the principal Government Institutions of Melbourne.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Portfolios of Music, by W. H. Glen. Bell and Stand.
- Kilner, Joseph, Bosisto Street, Richmond.—Pianoforte. Dulciana trichord instrument, full compass, with metal string plates, ivory-fronted keys, with perfect check repeater action, built on the soundest scientific theories, tone dolest; manufactured entirely from Colonial timber. Pianoforte. Full cottage, trichord throughout, three pedals, full metal plates, extended sound-board of Kauri pine, improved bass bridge, patent perfect repeater, check action, ivory-fronted keys, oval key pins, with the latest improvements. Colonial manufacture.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Maps of the Colony of Victoria. Map of Coalfield.
- Surveyor-General of Victoria, Melbourne.—Maps and Plans of the Colony of Victoria.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.—Maps and Geological Sketches.
- Cl. 100. Croaker, Scott & Co., Melbourne. Star Regulus of Antimony.
- Cl. 201. Apollo Stearine Candle Co., Melbourne. Stearine Candles. Paraffin Candles made from Australian Kerosene Shale. Stearine Products.

Cl. 215, 565. Wilson, George, & Co., 18, Queen Street, Melbourne. Gledhill's Improved Stopped Bottle and Bottling Rack for Aërated Waters.

Cl. 276. Blair, Dr. John, Melbourne. Improved Scissors to be used in removing enlarged tonsils, &c.

Cl. 342. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Patent Ceiling Ventilator, with ornamental centre-piece. Model of Victorian Bush Residence, with Huts and various kinds of fencing used in Australia.

Cl. 344. Bank of Victoria, Collins Street East, Melbourne. Bank Notes, issued by the Bank of Victoria. Statistics of the Bank, and its branches.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Sovereigns and Half-sovereigns, coined at the Victorian Branch of the Royal Mint, Melbourne.

Commercial Bank of Australia, Melbourne. Specimens of Bank Notes issued by the Commercial Bank of Australia. Photographs and Statistics of the Commercial Bank.

National Bank of Australasia, Melbourne. Specimens of Bank Notes issued by the National Bank of Australasia. Statistics of the National Bank.

Cl. 345. Penal Department, Inspector-General of, Melbourne. Warder's Uniform, Prisoner's Clothing, and Sundries.

Cl. 347. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Baskets, Mats, Trays, and Nets, made at Coranderrk Aboriginal Mission Station. Vocabulary of Victorian Aboriginal Dialects. Photographic Portraits of Victorian Aborigines.

Cl. 349. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Victorian Ensign, Blue, Local Naval Forces. Victorian Ensign, Red, Merchant Vessels.

Cl. 400. Summers, Charles, Melbourne. Hypermnestra and Lynceus, Group of Statuary.

Cl. 402. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Medals of the Victorian Intercolonial Exhibition, 1875. Seal of the Melbourne Public Library. Seal of the Melbourne University. Seal of the Melbourne Exhibition, 1862.

Cl. 410. Campbell, O. R., Punt Road, Windsor. Crossing the Plains.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Specimens of Heraldic Painting on Panels, including a Viscount's, an Earl's, and a Baron's Coat of Arms.

Curtis, J. W., Bourke Street East, Melbourne. Track off the Point Nepean Road.

Guerard, E. Von, Gipps Street East, Melbourne. Pulpit Rock, Cape Schank. Phillip Island. Ballarat in 1873.

Johnstone, H. J., Bourke Street East, Melbourne. "Summer Sunset—Lagoon near Seymour."

Whitehead, Isaac, Collins Street East, Melbourne. Dandenong State Forest.

Cl. 420. Bowman, John S., 81, Russell Street. The Knob in the Australian Alps, Crayon—Miss Bowman. In the Australian Alps, Crayon—Miss Adams. Fall from the Omeo Plains, Crayon. Valley in North Gipps Land, Crayon. A pool in the Otway Ranges, Crayon—F. Shaw. Bushey Park, Crayon.

Cl. 423. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Lithographs of Fossil Fruits and Seeds.

#### PHOTOGRAPHY.

Cl. 430. Ararat, Shire Council of, Ararat. Photographic Views and Statistics of the Shire of Ararat.

Batchelder & Co., Collins Street East, Melbourne. Photographs of Persons born in the Colony of Victoria.

Bock, Henry, Sale, Gippsland. Photographs of Victorian Native Flowers.

Chuck, T. F., Royal Arcade, Melbourne. Photographs of Persons born in the Colony of Victoria.

Colac, Shire Council of, Colac. Photographic Views of the District of Colac.

Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Photographic Views.

Creswick, Borough Council of, Creswick. Photographic Views and Statistics of the Borough of Creswick.

Darebin, Shire Council of, East Bourke. Photographic Views and Statistics of the Shire of Darebin.

Echuca, Borough Council of, Echuca. Photographic Views and Statistics of Echuca.

Emerald Hill, Borough Council of, Emerald Hill. Photographic Views of Emerald Hill.

Hotham, Town Council of, Hotham. Photographic Views and Statistics of the Town of Hotham.

Johnstone, O'Shannessy, & Co., Bourke Street, Melbourne. Photographs coloured in Oil.

M'Donald, D., High Street, St. Kilda. Photographic Views.

Noble, Timothy, Bourke Street East, Melbourne. Photographs of Theatrical Celebrities. Chevalier Blondin, Hero of Niagara.

Phoenix Foundry Co. (Limited), Ballarat. Photograph of Locomotives, Engine, and Tender, manufactured for the Victorian Government by the exhibitors.

Prahran, Town Council of, Prahran. Photographic Views and Statistics of the Town of Prahran.

Robertson Brothers, Colac. Coloured Photographs of Cattle bred by exhibitors.

Sandhurst, City of, Sandhurst. Photographic Views and Statistics of the City of Sandhurst.

Stewart & Co., Bourke Street East, Melbourne. Photographs of Persons born in the Colony of Victoria.

Surveyor-General of Victoria, Melbourne. Photographic Views of Botanical Gardens, Fitzroy Gardens, Carlton Gardens, Flagstaff Gardens, Melbourne (14).

Wangaratta, Shire Council of, Wangaratta. Photographic Views and Statistics of the Shire of Wangaratta.

Willett, G., Bridge Street, Ballarat. Coloured Photographs.

Wilson, Sir Samuel, Ercildoun. Photographs:—Team of Hereford Bullocks, bred by exhibitor. Residence of Exhibitor (2). Prize Sheep bred by exhibitor.

Cl. 432. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Biographical Charts of the Schools of Venice, the Venetian States, Genoa, Cremona, Mantua, Milan, Ferrara, Modena, and Palermo. Tools. Imperial folio, morocco, extra gilt.

Cl. 442. Dowling, William, Emerald Hill. Centre Flowers. Trusses.

Heathcote, T. S., Carlton. Painted Panels, Imitation Siena Marble. Painted Panels, Imitation Italian Pink Marble.

✶ Murphy, Edward, Sandridge Road, Melbourne. Centre Flowers and Ventilators. Registered Ornamental Chimney Cap.

Paterson, Brothers, Carlton. Tablets of Imitation Wood. Tablets of Imitation Marble.

✶ Pepper, George, Windsor. Plasterer's Models. Ceiling and Wall Patent Ventilators.

Cl. 501. Morrison, L. K., Melbourne. Patent Abyssinian Tube Wells and Pumps, with Boring Apparatus.

Cl. 503. White, David, Stawell. Patent Model Safety Hook, to prevent accidents from over-winding in Mining Claims. Full-sized working Hook.

Cl. 505. Harkness, A., & Co., Victoria Foundry, Shamrock Street, Sandhurst. Cliff's Patent Disc, fitted on screw stamper shank. Inside Shell, showing principle of Disc. Cook's Patent Cam or Wiper, for lifting Revolving Stamps.

Perry, Davis, & Co., Sandhurst. Stamper Gratings.

Cl. 571. Cornish & Co., 2, Elizabeth Street, Melbourne. Seats for Railway Carriages.

Cl. 573. Stoneman, Edward, Stephenson Street, Richmond. Railway Truck Spring.

Cl. 590. Cornish & Co., 2, Elizabeth Street, Melbourne. Life Preserving Mattresses. Life Buoys. Combined Life Belts and Pillows. Model of Life Saving Raft. Seats and Couches for general use in Ships. Ordinary Mattresses.

Cl. 600. Bass River Steam Saw Mills, Bass River. Blue Gum Timber.

✶ Botanic Gardens, Director of, Melbourne. Carpological collection. Woods, timbers, gums, and resins.

Cl. 601. Commissioners for Philadelphia Exhibition, Melbourne. Boxes made of Victorian Wood.

Cl. 602. Clark, John, & Sons, Lonsdale Street East, Melbourne. Wattle Bark for tanning purposes. Ground Wattle Bark, for tanning purposes.

Cl. 610. Draper & Harbison, Melbourne. Varieties of Apples—fresh fruit.

✶ Cl. 620. Adams, James, Warring. White Tuscan Wheat.

- P Buckley, Edward, Newbridge, Loddon. Red Straw Wheat, from the Loddon district, grown in the county of Gladstone. Red Straw Wheat, grown in the county of Bendigo. Oats.  
 Connor, James, Allansford. Foxtail Oats, grown at Merunga, near Warrnambool.  
 P Gilmour, Andrew, Colvinsky, Buangor. Oats grown in the parish of Ballyrogan. Short Oats. Tartarian Oats.  
 Jack, John, Oxley Plains, Owens District. Frampton White Wheat, grown on chocolate soil after English grass.  
 Laidlay, John, Bundoola, Plenty-road. Wheat.  
 McNair, Angus, Bellerine East. New Fodder Pea; yield, 45 bushels to the acre.  
 P Moncrieff, John, Tabilk, Goulbourn River. Purple Straw Wheat. White Wheat.  
 White Tuscan Wheat.  
 P Myring, Joseph, Campbell's Creek, Castlemaine. Barley.  
 P North-Eastern Pastoral and Agricultural Society, Murchison. Wheat grown by J. M'Nab, Tabilk.  
 P O'Keefe, Andrew, Adelaide Vale, Clare Inn. Purple Straw Wheat.  
 P Polson, Angus, Chapman, Moyston. English Barley. Tartarian Oats. Purple Straw Wheat. White Wheat.  
 P Rossi, Thomas, Dry Diggings, near Daylesford. Purple Straw Wheat.  
 Schmitt, Louis, Mornington. Wheat.  
 P Scott, James, Indigo, Chiltern. Wheat grown by the exhibitor.  
 P St. Arnaud Pastoral and Agricultural Society, St. Arnaud. Short Oats. Wheat. Barley.  
 Stewart & Ferguson, Indigo, Chiltern. Wheat, grown by exhibitors.  
 Taylor, John, Allansford. Adelaide. Wheat, grown at Merunga, near Warrnambool.  
 West Bourke Pastoral and Agricultural Society, Romsey. White Tuscan Wheat, grown by the Hon. T. F. Hamilton, M.L.C., President of the Society.  
 Patience, John, Echuca, Victoria. Purple Straw Wheat.  
 Kelly, Mortimer, Bridgwater. Wheat.  
 P O'Reilly, Thomas, Toolamba. Wheat.  
 Paterson, J. M., Dyalong. Wheat.  
 P Smith, George, Ballarat. Rye Grass Seed. White Tuscan Wheat.  
 P Wright, T. S., Rochester. Purple Straw Wheat.  
 P Catelin, James, Runnymede. Purple Straw Wheat. Port Macdonnell Wheat. White Tuscan Wheat.  
 P Ararat Flour Mill Co., Ararat, Victoria. Prime Milling Wheat.  
 Buckley, Edward, Newbridge, Victoria. Red Straw Wheat. Oats. Flour.  
 Cl. 621. McNair, Angus, Bellerine East. New Fodder Pea, 1876. Yorkshire Hero Pea. Prussian Blue Pea. Long Pod Bean.  
 Cl. 623. Aboriginal Mission Station, Corranderrk. Victorian Hops grown at the Corranderrk Aboriginal Mission Station.  
 P P P P P M'Kensie, Jas. F., & Co., 3, Queen Street, Melbourne. Eagle-brand Coffee. Chicory, manufactured from root grown in Victoria. Mixed Spice. Ground Cinnamon. Homeopathic Cocoa, manufactured from Trinidad nuts. Chocolate manufactured from Trinidad nuts. Vanilla Chocolate Sticks, manufactured from Trinidad nuts. Mustard, manufactured from seed grown in Victoria.

#### LAND ANIMALS.

- Cl. 635. St. John, F., 22, Chetwynd Street West, Melbourne. Australian Birds. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Stuffed Water-fowl, by Chas. French.  
 Gaskell, Joseph, Elizabeth Street, Melbourne. Australian Snipe.  
 Grimwood, Thomas, Eern Tree Gully. Specimens of Quail, Snipe, and Landrail.  
 Robertson, W. W., 52, Bridge Road, Richmond. Collection of Australian Native Birds.  
 Cl. 637. Gaskell, Joseph, 118, Elizabeth Street, Melbourne. Australian Wild Animals.  
 Godfrey, F. R., Melbourne. Australian Wild Animals.  
 M'Coy, Professor, Melbourne University. Australian Wild Animals.  
 Cl. 638. French, C., Botanic Gardens, Melbourne. Australian Longicorns, puprestides—&c.—the majority destructive to Timber by boring. Australian Lepidoptera.  
 Timbrell, Ann, Plenty Road, Collingwood. Japan Black and White Silkworms, modelled in Wax.

- CL. 641. St. John F., 22, Chetwynd Street, Melbourne. Australian Fish.
- CL. 651. Bird, George, Inkerman, Lyndhurst. Colonial-made Cheese.
- Pierce, G. G., Bourke Street East, Melbourne. Cheese from the Heidelberg Factory.
- Riddle, J., Lancefield. Cheese.
- CL. 652. Brearley, Bros., Geelong. Sole Leather.
- Clark, John, & Sons, Lonsdale Street East, Melbourne. Sole Leathers. Kip Leather. Calf Skins. Kangaroo Skins. Wallaby Skins. Sheep Skins. Harness Leather. Basils.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Rugs made from the Skins of Victorian animals, viz., Kangaroo, Wallaby, Opossum, Native Cat, Native Bear, &c.
- Dunkley & M'Bride, 28, A'Beckett Street East, Melbourne. Gut, Sash Lines.
- Fink, M., Geelong. Skins of the Wallaby, Native Cat, Native Bear, and Opossum.
- Fitts, Charles, & Sons, 67, Cecil Street, Emerald Hill. Glue.
- Pearse Bros., Fremantle, Western Australia. Dugong Fish Hide. Black Harness Leather. Hides.
- Penal Department, Inspector-General of, Melbourne. Skins of Leather. Calf, Kip, Harness, Black Leather and Sole Leather.
- Quinn, H. S., Newton Street, Richmond. Dyed and White Wool Mats, consisting of bright canary, dark amber, roan, magenta, violet, and white. Kangaroo Glove Leathers.
- Wallis and Co., Burnley Street, Richmond. Shoe Leathers and Furniture Leathers for jewel cases, &c., &c.
- CL. 657. Boddy, Edward, Nagambie. Fine Flour.
- Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. — Flour from Winter Wheat.
- Hood, F. & J., 81, Elizabeth Street North, Melbourne. Victorian-made Malt.
- Martin, P. J., Little Flinders Street East, Melbourne. Victorian Malt.
- McKenzie, Jas. F., & Co., 3, Queen Street, Melbourne. Oatmeal, manufactured from colonial oats. Groats, manufactured from colonial oats. Brosemeal.
- Myring, Joseph, Campbell's Creek, Castlemaine. Colonial Malt.
- Perrin, William, jun., Stephenson Street, Richmond. Victorian Malt, made from Victorian and New Zealand grown barley.
- CL. 656. Bennett, T. K., Bourke Street, Melbourne. Preserved Meats, consisting of Roast Beef, Boiled Beef, Corned Beef, Boiled Mutton, Roast Mutton, Ox-tail Soup, Mock Turtle Soup, and Potted Head.
- Botanic Gardens, Director of, Melbourne. Jam made from Kaii Apples.
- Comport, Henry, Cheltenham. Tomato Sauce.
- Grant, Mrs., Bridge Road, Richmond. Tomato Sauce.
- Lyon, George, Beechworth. Tomato Sauce.
- Melbourne Meat Preserving Co., 56, Queen Street, Melbourne. Preserved Meats.
- Stringer & Co., 43, King Street, Melbourne. Mixed Pickles. Sauces. Curry Powder.
- Watson & Paterson, Bourke Street West, Melbourne. Hams. Middles of Bacon. Mess Pork.
- Western Meat Preserving Co. (Limited), Colac. Preserved Meats, comprising Roast Beef, Corned Beef, Roast Turkey, Ox-Tail Soup, Brown Rabbit Soup, &c.
- Wright, Payne, & Co., Chapel Street South, Yarra. Jams made from Victorian fruits, consisting of golden drop, raspberry, green-gage, plum, damson, violet plum, magnum bonum plum, black currant, and gooseberry.
- Zorn, Edward, Clayton's Road, near Oakleigh. Tomato Sauce. Zorn's Oakleigh Sauce.

## ARARAT DISTRICT.

- CL. 660. Trouette & Blampied, Great Western, Burgundy, 1871. Mixed Grapes. Claret, 1871. Riesling, Little Muscat, 1874.
- Best, Joseph, Great Western. Hemitage, 1871.

## BEECHWORTH DISTRICT.

- Docker, F. G. & J. B., Wangaratta. Shiraz, 1869.
- Evans, Henry, Beechworth. Shiraz, 1872.

## CASTLEMAINE DISTRICT.

- Mellon, Francis, Dunolly. Hermitage, 1871. Pineau, 1872.  
 Botten, William, Eddington. Burgundy, 1869.  
 P Jung, Otto, Castlemaine. Hermitage, 1871. Roussette, 1871.  
 Schroeder, E., Castlemaine. Riesling and Pineau Blanc, 1870.  
 P Crippa, Fabrizio, Hepburn. Hermitage, 1871.

## ECHUCA DISTRICT.

- Greer & Co., Echuca. Shiraz, 1871. Shiraz, fruity, 1872. Shiraz, 1873.  
 Vettler, John, Echuca. Hermitage, 1870. Grenache, 1870. Verdelho, 1872.  
 Carbinet Sauvignon, 1871.

## GEELONG DISTRICT.

- Weber, Jacob, Geelong. Hermitage, 1874.  
 Deppeler, Jacob, Gheringhap. Hermitage, 1874.  
 Ritchie, John, Murgheboluc, Geelong. Hermitage, 1874.

## GOULBURN DISTRICT.

- P Bear & Ford, Tabilk Vineyard, near Seymour. Riesling, 1872.  
 P Egli, F., Tabilk. Hermitage, 1873.

## MELBOURNE DISTRICT.

- P Cl. 660. Schmitt, Franz, Berwick. Riesling, 1872.  
 Francis, Charles, Sunbury. Hermitage, 1871. Gouais, 1870.  
 P St. Hubert's Vineyard Co., Yering, Riesling, 1869. Chasselas, 1869. Chasselas, 1871.  
 P Johnston, J. S., Craiglie Vineyard, Sunbury. Riesling, 1872. Verdelho, 1871. Hermitage, 1869. Riesling, Shepherd's and German, 1871.  
 P Maplestone, Charles, Ivanhoe Lodge, Heidelberg. Hermitage and Carbinet, 1870. Riesling, large and small, 1872. Riesling, 1870.  
 P Brasche, Charles, Sunbury. Shepherd's Riesling, 1871.  
 Snowden, E. G., Boroondara. Riesling (large), 1871.

## MURRAY DISTRICT.

- P Smith, G. S., Wahgunyah. Muscatel, 1869.

## SANDHURST DISTRICT.

- P Pohl, Carl, Strathfieldsaye. Hermitage, 1870. Hermitage, 1871. Hermitage, 1873. Hermitage, 1874. Carbinet and Hermitage, 1868. Verdelho, 1874.  
 Bruhn, Albert, Strathfieldsaye, Sandhurst, Verdelho, 1872. Hermitage, 1874. Carbinet and Hermitage, 1873. Mataro, 1874.  
 Fuchs, Adolph, Strathfieldsaye, Sandhurst. Verdelho, 1873. Hermitage, 1873. Carbinet, 1878.  
 Fischer, August, Shamrock Vineyard, Enn Creek, Strathfieldsaye. Verdelho, 1874. Verdelho, 1873. Hermitage, 1874.  
 Shaw, F. K., Goornong. Hermitage, 1871.  
 P Grosse, Frederick, Strathfieldsaye. Hermitage, 1873. Carbinet, 1873.  
 Grosse, Frederick, Toorongo Vineyard, Bendigo. Verdelho, 1873.  
 Greiffenhagen, Wm., Strathfieldsaye, Riesling, 1871. Hermitage, 1872.  
 Brown, H. J., Australian Distillery, Melbourne. Geneva. Spirits of Wine  
 Fuller, Alfred, Kew. Bottled Ale and Stout.  
 Henelly, James, 140, Latrobe Street West, Melbourne. XXXX Ale.  
 P Latham, Edward, Carlton Brewery, Carlton. Ale. Porter.  
 P Martin, P. J., Little Flinders Street East, Melbourne. Ale Brewed from Victorian Malt and Tasmanian Hops.  
 PPP Reed, Henry, & Co., Chapel Street, South Yarra. Vinegar in bulk, and bottle. Lime Juice Cordial. Raspberry Vinegar.  
 Stewart, James, Eaglehawk, Sandhurst. Ale. Bottled Ale.  
 P Treacy, John, & Co., Geelong. Pale Ale and Stout, in bottle.  
 P Warrenheip Distillery Company, Sturt Street, Ballarat. Whisky, 1874, 1875. Geneva, proof and o.p. Spirits of Wine.  
 Cl. 661. Guest, T. B., & Co., William Street, Melbourne. Fancy Biscuits, consisting of Ginger Nuts, Victorias, Meal Crackers, Cracknells, Pionics, Lime Biscuits.

- P Smith & Son, Miller and Anderson Streets West, Melbourne. Fancy and Dessert Biscuits.  
 Swallow & Ariell, Sandridge and Melbourne. Fancy Biscuits. Cabin and Pilot Biscuits.
- P Cl. 665. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Samples of Cotton, grown from New Orleans Seed on the Murray, Victoria.
- Cl. 666. Atkinson, William, Camperdown. Teazles, one stave containing 300 head.  
 Longmire, Thomas, Kooroocheang, Smeaton. Two Samples of Flax Stalks, and Seeds thereon, Nos. 1 and 2. No. 1 sown on 20th May, 1874, No. 2 sown on 1st September, 1874. Both samples grown on similar land, the only difference being in time of sowing.  
 M'Pherson, Thomas, and Co., 205, Bourke Street West, Melbourne. Jute, in raw state.
- P Cl. 667. Armstrong, Alexander, Warrantine, Shelford. Merino Fleeces.
- P Arnold, George, & Co., Market Buildings, Melbourne. Merino Fleeces.
- P Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Wool.
- P Cuming, F. F., Stonepoint. Wool.
- P Currie, John Lang, Larra, Derimallum, Victoria. Lambs' and Merino Ewe Wool.
- Degraives, C. & J., Coliban Park, Elphinstone. Washed Fleece Wool, Lambs'.
- P Elder, W. & N. G., Elder, Rookwood. Merino Wool.
- P Goldsbrough, R. & Co., Wool Warehouse, Bourke Street West. Wool.
- Greeves, Edward G., Berriallock, Skipton Victoria. Merino Wool.
- P Hastings, Cunningham & Co., The Australasian Wool Stores, Collins Street West. Fleeces of Merino Wool from sundry breeders.
- Henty, Edward, Portland. Wool.
- P Lang, William, Wargam, Wanganilla, New South Wales. Merino Wool and Wool.
- P M'Vean, John, Wooloomoonoo, N.S.W. Merino Wool.
- P Reeves, Isaac Godfrey, Footscray, Melbourne. Wool.
- P Russell, Thomas, Barunah Plains, Mount Hesse. Wool.
- Routledge, William, Farnham Park, Warrnambool. Fleeces.
- Rutherford, Andrew, Como, Kensington, Geelong. Fleeces, Wool.
- Synnot, Monckton, Little Flinders Street, Melbourne. Wool.
- P Synnot, George & Co., Geelong. Lincoln Wool.
- P Timms Brothers, Mount Hesse, Beeac. Wool.
- Watson, Alexander, Warribee. Merino Fleeces.
- P Wilson, Sir Samuel, Oakleigh Hall, East St. Kilda. Fleeces.
- P Wilson, John, Lismore. Merino Wool.
- Cl. 688. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne. Silk Cocoons.
- Howard, John, near Albury. Sample Cocoons, Floss Silk, &c.
- Cl. 670. Lennon, Hugh, Elizabeth Street North, Melbourne. Excelsior Double Furrow Plough.
- Cl. 674. Bodington, Robert, 4, Queensbury Street, Carlton. Sharp's Patent Sheep Support on Rollers, used in the Washing of Sheep by Spouts or Jets.
- P Cl. 707. Commissioners for Victoria for the Philadelphia Exhibition. Melbourne. Tree and Todea Ferns.
- Cl. 709. Commissioners for Victoria for the Philadelphia Exhibition, Melbourne.
- The following *fac-similes* consist of specimens, the originals of which were selected during the past season, modelled and arranged for the Commissioners by Mr. Thos. M'Millan. They embrace most of all the important species cultivated, and in many cases such assortments of varieties as are calculated to sufficiently illustrate the orchard and other open ground fruit-producing capabilities of Victoria.

#### ARBORESCENT FRUITS.

##### POMACEOUS FRUITS, INCLUDING THE APPLE AND PEAR AND THEIR ALLIES.

The Apple—*Pyrus malus*.

The Pear—*Pyrus communis*.

(2) The Quince—*Cydonia vulgaris*.

The Medlar—*Mespilus Germanica*.

The Loquat—*Eriobotrya Japonica*.

## STONE FRUITS, OR FLESHY DRUPES.

1. *Drupacea vera*.

The Peach—*Amygdalus*.

The Nectarine—*Amygdalus Persica* var.

The Apricot—*Prunus Armeniaca*.

The Plum—*Prunus domestica*.

The Cherry—*Prunus cerasus*.

2. *Oleacea*.

The Olea Europæa (Photograph).

## BERRIED OR BACCATE FRUITS AND THEIR MODIFICATIONS.

The Grape—*Vitis vinifera*.

The Mulberry—*Morus nigra*.

The Fig—*Ficus carica*.

The Pomegranate—*Punica Granatum*.

The Orange or Citron tribe—*Citrus*.

The Kau Apple—*Aberia Caffra*.

The Gooseberry—*Ribes Grossularia*.

The Black Currant—*Ribes nigrum*.

The Red Currant—*Ribes rubrum*.

The White Currant—*Ribes rubrum* fr. Album.

The Raspberry—*Rubus idæus*.

## NUTS AND DRY DRUPES.

The Almond, Walnut, and Hazel.

## ANNUAL AND PERENNIAL HERBACEOUS FRUITS.

The Strawberry—*Fragaria vesca*.

The Tomoto—*Lycopersicum esculentum*.

The Egg Apple. *Melongena*—*Solanum melongena*.

The Cape Gooseberry—*Physalis edulis*.

The Capsicum—*C. Annuum*.

For illustrations of the Melon, Cucumber, Squash, and Gourd, see Photographs.

Book Collection of Phænogamous Plants, Shrubs, Trees, Herbs.

Commissioners for Victoria at the Philadelphia Exhibition, Melbourne. Citron or Orange Tribe, 17 species. Cherries, 25 Species, 3 fruits each. Figs, 4 varieties. Pears. Strawberries. Plums. Apples. Apricots. Currants. Gooseberries. Walnuts. Peaches.

Gaskell, Mrs., 118, Elizabeth Street, Melbourne. Fac-similes of Victorian Bush Flowers.



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BAHAMAS.

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**COMMISSIONER FROM BAHAMAS TO THE PHILADELPHIA  
INTERNATIONAL EXHIBITION, 1876.**

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**Dr. EDWARD Y. WEBB.**

## BRITISH COLONIES.

### BAHAMAS.

#### *History.*

A chain of islands lying between 21° 42' and 27° 34' N. lat., and 72° 40' and 79° 5' W. long. The group is composed of about 20 inhabited islands and an immense number of islets and rocks. The principal islands are New Providence (containing the capital, Nassau), Abaco, Harbour Island, Eleuthera, Inagua, Mayaguana, St. Salvador, Andros Island, Great Bahama, Ragged Island, Rum Cay, Exuma, Long Island, Crooked Island, Acklin Island, Long Cay, Watling's Island, the Berry Islands, and the Biminis.

Position.

Islands in Group.

St. Salvador, one of the islands composing this chain, was the first land discovered by Columbus on his voyage in 1492. New Providence was settled by the English in 1629, and held till 1641, when the Spaniards expelled them, but made no attempts to settle there themselves. It was again colonized by England in 1667, but fell into the hands of the French and Spaniards in 1703, after which it became a rendezvous for pirates, who were, in 1718, extirpated, when a regular colonial administration was established, and the seat of Government was fixed there. In 1781 the Bahamas were surrendered to the Spaniards, but at the conclusion of the war they were once more annexed by, and finally confirmed to, Great Britain at the Peace of Versailles, 1783.

St. Salvador

In 1848 the Turks and Caicos Islands were separated from the other Bahamas, and formed into a distinct Government, under the Government-in-Chief of the Governor of Jamaica.

Turks and  
Caicos Islands.

The Turks and Caicos Islands lie between 21° and 22° N. lat., and 71° and 72° 37' W. long.

#### *Trade and Industry.*

There are ten colonial custom-houses and ports of entry in the Government of the Bahamas, *viz.*, Nassau, Abaco, Eleuthera, Harbour Island, Exuma, Rum Cay, Long Island, Long Cay, Inagua, and Ragged Island. Considerable quantities of pine-apples, oranges, and sponges are exported, chiefly to England and the United States.

Custom Houses  
and Ports of  
Entry.

The pine-apple crop is very precarious. The industry of salt raking has ceased to be remunerative, owing to the high protective duties imposed on salt by the United States.

Pine-Apple Crop.  
Salt raking.

Experiments in castor oil, cotton, tobacco, coffee and nut planting and other branches of industry have been commenced under the patronage of the present Governor.

Industrial  
Experiments.

Local Boards of Agriculture have been established in all the out-islands with a view to encouraging these new industries.

Local Boards of  
Agriculture.

#### *Constitution.*

The Executive Government is conducted by the Governor, aided by an Executive Council of 8 members. The Legislative Authority resides in the Governor, a Legislative Council of 9 members, and a Representative Assembly of 28 members. The qualifications of electors are full age, a residence of 12 months, of which 6 have been as freeholder or housekeeper, or a residence of 6 months, and a payment of duties to the amount of 26*l.* 0*s.* 10*d.* The qualification of members is possession of an estate of real or personal property of the value of 500*l.* The Executive Council is composed partly of official and partly of unofficial members. They usually have a seat in one of the branches of the Legislature.

Executive  
Government.  
Legislative  
Council and  
Representative  
Assembly.

*Revenue and Expenditure.*

		£		£	
1864	-	-	102,024	-	98,636
1865	-	-	84,488	-	83,549
1866	-	-	53,283	-	76,985
1867	-	-	46,826	-	80,372
1868	-	-	40,777	-	68,306
1869	-	-	35,576	-	39,304
1870	-	-	40,710	-	47,270
1871	-	-	41,869	-	40,662
1872	-	-	37,574	-	39,000
1873	-	-	55,289	-	51,881
1874	-	-	37,283	-	38,374
1875	-	-	38,981	-	39,083

*Public Debt, 1876, 72,581l.**Imports and Exports.*

		£		£	
1864	-	-	5,346,132	-	4,672,398
1865	-	-	1,470,467	-	2,063,474
1866	-	-	328,622	-	261,972
1867	-	-	365,316	-	227,248
1868	-	-	231,526	-	131,522
1869	-	-	240,584	-	163,002
1870	-	-	283,970	-	190,253
1871	-	-	239,190	-	152,410
1872	-	-	201,051	-	136,224
1873	-	-	226,306	-	156,613
1874	-	-	183,993	-	130,293
1875	-	-	165,970	-	102,214

*Population.*

39,162 (Census 1871).

(From "Colonial Office List 1876.")

*Discovery.*

The history of the Bahamas began in 1492, when Columbus, the great pioneer, navigator, and discoverer of the New World, landed on the shore of Guanahani and named it St. Salvador. Commerce did not immediately follow in the wake of discovery, but about 250 years after that event, pine apples were grown at and exported from Eleuthera, and 50 years later cotton was extensively cultivated, and salt and wood added to the exports.

*Staple productions.*

At the present time the Colony's staples are salt, fruit, sponge, barks, dye and furniture woods, guano, and straw, turtle shell, fish scale and shell work.

*Fair representative Exhibition at Philadelphia. Salubrity of Group.*

The articles on exhibition fairly represented the productions and manufactures of these islands, and both might be indefinitely extended. But it is not the commercial position of the Bahamas only which should make a knowledge of them general. Their equality and wonderful salubrity of climate commend them to all who seek a genial, healthy, life-giving atmosphere. As a winter home for the afflicted, Peter Henry Bruce wrote nearly a century and a half ago, "It is no wonder the sick fly hither for relief, being sure to find a cure here." Modern travellers also testify that as a resort from damp and cold to sunshine and summer for those who require change and climatic benefit the Bahamas offer peculiar advantages. The heat is tempered by an ocean breeze of softness and purity seldom experienced elsewhere. Tropical flowers gladden the eye, and the luscious pineapple, orange, and melon tempt the palate with their freshness and beauty. Fish abound in the clear pellucid water surrounding these islands, and the northern fowl seek a home on the lakes. In a word, the Bahamas seem by nature fitted as a grand sanitarium for the afflicted from the North American Continent, and as a most desirable winter resort for all who wish to escape the rigours of the Northern Season.

*Natural advantages.**Bahamas, the Madeira of the West.*

LIST OF CONTRIBUTIONS from the COLONY to the PHILADELPHIA  
INTERNATIONAL EXHIBITION, 1876.

✶ signifies Award for Exhibit.

(The Government of the Bahama Islands received also an award for its Collective Exhibit.)

CLASS 102.

Dupuch, Joseph. 1 block Building Stone, to be presented to Cornell Stone University.

George, Jno. S. 2 blocks Building Stone, to be presented to Cornell University.

CLASS 200.

*Salt.*

Meadows, Jno. G., Inagua, Sargent, D., Inagua, 1 case containing specimens of Salt and jar of Table Salt. This salt is largely exported to the United States and to British North America.

CLASS 218.

✶ Robertson, Mrs. S. E. Case containing Epergne, valued at \$500. Epergne.

CLASS 224.

Dorsette, Thomas. 1 Dripstone manufactured out of Lime Stone, for filtering water. Filter.

CLASS 253, 254.—*Shell and Fish Scale Work.*

Atwell, The Misses. Cases containing Memorial Wreath (\$140), Cornucopia (\$45), 1 doz. sets Brooches and Earrings, \$3 each or \$35 the lot. All manufactured out of shells and fish scales. Jewellery.

Evans, Ellen G. E. Cases containing 1 Shell Cross (\$100), 1 Shell Basket (\$60), 1 Bridal Wreath (\$30). Manufactured out of Bahama Shells.

✶ Garner, Mrs. Maria E. Cases containing 1 Basket (\$60), 1 Fruit Basket (\$60), 1 Bridal Wreath (\$20), 1 Spray (\$4), 2 do. \$3 each. Manufactured out of Bahama Shells.

*Palmetto Work and Walking Sticks.*

Centennial Exhibition Committee, Nassau. 1 case containing Palmetto work, viz., 6 Fans, each \$1 50, 3 Pearl Edge Hats, \$3, 3 Edging for Hats, \$2. Manufactured by Mrs. Jno. Taylor, Inagua. Palmetto Work.

Dupuch, Joseph. 1 Card Tray, \$4, manufactured out of 9 different woods. 5 Bread Platters, \$1 50, manufactured out of various woods. 3 Bread Platters, to be presented to Cornell University, Ithaca, N.Y.

Eldon, Mrs. James. Case containing 1 Orange Tree (\$25).

Armbrister, James A. 18 Walking Canes, viz.:—12 Green Ebony, \$1 25. 6 Satin Wood, \$1 25. Manufactured at Long Island, Bahamas. Walking Canes, many varieties.

Dupuch, Joseph. 65 Walking Canes, all manufactured out of woods growing in the Bahamas. 2 Crab Wood, each \$1 25, can be supplied in Nassau from the tree at \$12 per 100. 2 Red Crab Wood, each \$1 25, in Nassau at \$12 per 100. 2 Cassava Wood, each \$1, in Nassau at 4c. per foot. 2 Black Torch, each \$1 25, in Nassau at \$12 per 100. 2 Lignum Vitæ, each 75c., in Nassau at \$12 per ton. 2 Coconut Wood, each \$1. 2 Mahogany, each \$1, in Nassau at 4c. per foot. 2 Sabicu, each \$1, in Nassau at 4c. per foot. 2 Satin Wood, each 75c., in Nassau at 4c. per foot. 2 Iron Wood, each \$1 25, in Nassau at \$12 per 100. 2 Green Ebony, each \$1 25. 2 Red Stopper, each \$1, in Nassau at 4c. per foot. 3 White Stopper, each 50c., in Nassau at 4c. per foot. 2 Mastic Wood, each 75c., in Nassau at 4c. per foot. 2 Saffron Wood, 50c., in Nassau at \$12 per 100. 2 Cascarella, with bark, each 50c., in Nassau at \$12 per 100. 2 Crab Wood with bark, each 50c., in Nassau at \$12 per 100. 1 Prince Wood, with bark, each 25c., in Nassau at \$12 per 100. 3 Red Stopper Wood, with bark, each 25c., in Nassau at \$12 per 100. 1 White Stopper Wood, with bark, each 25c., in Nassau at \$12 per 100. 6 Hercules Club Wood, with bark, set \$4, in Nassau at \$10 per 100. 4 Wild Lemon Wood, with bark, each 25c., in Nassau at \$12 per 100. 2 Tamarind

Wood, with bark, 25c., in Nassau at \$8 per 100. 2 White Torch Wood, with bark, 50c., in Nassau at \$12 per 100. 2 Black Torch Wood, with bark, 50c., in Nassau at \$12 per 100. 2 Guava Wood, with bark, 25c., in Nassau at \$12 per 100. 2 Wild Coffee Wood, with bark, 25c., in Nassau at \$12 per 100. 3 Wild Cane, with bark, 25c., in Nassau at \$4 per 100. 2 Lemon Wood, with bark, 25c., in Nassau at \$15 per 100.

Wallace, Alexander C. Walking Canes, viz., 4 Crab Wood, with heads, \$2 50. 2 Crab Wood, without heads, \$1 50. 2 Green Ebony, \$2 50.

*Mimosa Bean Work.—Tortoise Shell Ornaments.*

**Mimosa Bean Work.**

Grant, Misses Julia and Mary. 1 case containing Mimosa Bean Work, viz., set of Lady's Ornaments, \$5, 1 Card Tray, \$4 50, 1 pair Watch Cases, \$2 50, 1 pair Mats \$1, 1 case containing Cross, \$12.

Centennial Exhibition Committee, Nassau. 1 case Mimosa Bean ornaments, containing 1 card basket (\$4 50), 2 Bags (\$4), 2 pairs Bracelets, each \$1 50. Manufactured by Messrs. Jarrett, Nassau.

The Mimosa grows wild in the Bahamas.

**Tortoise Shell Ornaments.**

Minns, Albert C. J. 1 case containing Tortoise Shell Ornaments, viz., Lady's set, consisting of Necklace, Pin and Earrings, Bracelets, Solitaires and Studs, \$140; Gentleman's set, consisting of Albert Chain and Charms, Scarf Ring, Solitaires, Studs, and vest buttons, \$50; Lady's Necklace and Locket, \$30; 1 Spoon, 1 Paper knife, \$10. All the Tortoise Shell Work is manufactured by hand, and is warranted genuine.

Symonett, Mrs. Matthew. Cases containing 1 Palm Tree, \$12; 1 Watch Stand, \$25.

**Tortoise Work.**

Centennial Exhibition Committee, Nassau. 1 Tortoise Back, cleaned and polished entire (\$75). Cleaned and polished by J. R. Saunders, Nassau.

CLASS 287.

**Rope from Aloe Fibre.**

Carrol, Richard E.,\* Long Island. Specimens of rope made out of Fibres of the Aloe.

Not exported, but extensively used in the Bahamas.

**Palmetto Rope.**

Centennial Exhibition Committee, Nassau.\* Specimens of Palmetto Rope, 3 sizes.

CLASS 287, 289.

**Rope from Wild Fig Tree Bark. Palmetto Baskets.**

Knowles, Joseph A.,\* Long Island. Wild Fig Tree Bark manufactured into Rope and Net; Palmetto rope. Specimens of Palmetto Baskets (3), Palmetto Mats.

CLASS 600.

**Bark Products.**

Knowles, Joseph A.,\* Long Island. Specimens of Wild Fig Tree (bark), very durable when manufactured into Rope.

CLASS 600, 601, 602, 603.

**Wood for furniture, and dyes, gums, &c. Palmetto Leaves. Barks, Cascarilla and Canella Alba.**

George, Jno. S. 1 piece Logwood (dye), generally exported to London. Specimen of Palmetto Leaves. Indigenous to the Bahamas, can be extensively exported. Specimens of Bark (Cascarilla and Canella Alba). Exported to United States and London. 4 pieces Braziletto (dye), generally exported to the United States. 2 pieces Green Ebony (dye). 1 piece Yellow Pine (furniture). Large forests of pitch pine are in the Bahamas not utilized. 1 piece Sabicu or Horseflesh (furniture). 1 piece Mahogany (furniture). 1 piece Cedar (furniture). 1 piece Satin Wood (furniture). 1 piece Stopper Wood (furniture). 1 piece Orange Wood (furniture), not at present exported. 1 piece Lignum Vitæ (furniture), exported to London. Wax, made from Myrtle berry. Exported to London.

☞ for Wax.

☞ for Barks. Canella and Cascarilla Bark.

Sawyer, R. H., & Co. Specimens of Bark (Canella alba and Cascarilla). Exported to United States, and London. 1 log Sabicu or Horseflesh (furniture), very durable wood, used for building purposes. 2 crotchets Mahogany or Madeira (furniture), this wood is largely exported to London. 2 pieces Satin Wood (furniture), this wood is largely exported to London. 1 piece

\* For presentation to the Smithsonian Institution, Washington.

Bull Wood (furniture), a new wood not at present exported, very handsomely curled. 1 piece Cedar (furniture), used for building purposes. 1 piece Cocoanut Wood (furniture.) 1 piece Stopper Wood (furniture), very durable, used principally for the piles of wharves. 1 ship's knee of Sabicu; knees like the one exhibited can be largely exported. 3 pieces Green Ebony (dye), largely exported to London. 4 pieces Braziletto Wood (dye), generally exported to the United States. 1 piece Logwood (dye), generally exported to London. Myrtleberry Wax. Exported to London.

## CLASS 604.

Saunders, Saml. P. Specimen of Mammee Sapota or Vegetable Sponge, Vegetable  
excellent for bathing purposes; price about 3c. each. Sponge.

## CLASS 623.

Boyd, Adam. Specimens of Tobacco and Coffee cultivated in New Providence. Tobacco and  
Coffee.

## CLASS 645.

*Shells and Tortoise Shell.*

Sawyer, R. H., & Co. 6 King Conch Shells, 6 Queen Conch Shells, 6 Common Pink Conch Shells, 3 Lamp Conch Shells. These Shells are Various Specimens of Shells,  
largely exported to London. and Tortoise Shell.

George, John S. 7 Queen Conch Shells. 6 pieces Tortoise Shell; obtained from Hawksbill Turtle, largely exported to London. 1 lot Loggerhead Shell; obtained from Loggerhead Turtle, largely exported to London.

Saunders, Samuel P. 1 case containing about 100 varieties small shells, \$100. The shells in this case were collected in the Bahamas.

Treco, P. A. 1 case containing Bahama shells, \$100. The shells were collected and arranged by J. R. Saunders.

## CLASS 650.

*Sponges.*

✓ Sawyer, R. H., & Co. 1 String Sheep Wool, 1 Velvet, 1 Yellow, 1 Grass, 1 Reef. Largely exported to London and the United States. Sponges.

## CLASS 654, 658.

George, Jno. S. Arrow Root and Casava Starch, Bahama manufacture; Bees Wax. Arrow Root,  
Casava Starch,  
Bees Wax.

## CLASS 656.

Centennial Exhibition Committee, Nassau. 18 bottles of assorted Preserved Fruits, each \$1 50; 4 assorted Pickles, \$1 50; 1 Pimento \$1 50, manufactured out of native fruits by Daphne Fife. Preserved Fruits.

## CLASS 665.

Sawyer, R. H., & Co.,\* Saunders, S. P., Brice, D. A.\* Specimens of Cotton. Cotton, produced principally at Long Island and exported to London.

## CLASS 666.

Centennial Exhibition Committee, Nassau.\* 1 case containing specimens of Fibres. Fibres.  
of Fibres, of the Pita Plant, Plaintain Tree, Banana Tree, Pine Apple plant, Aloe, Esparto Grass. 1 case containing specimens of Fibres, viz., wool made from leaf of Forest Pine, Pita Plant, Banana Tree, and Plaintain. None of the Bahama fibres are at present utilized, they could, however, be obtained and exported in large quantities.

## CLASS 681.

Saunders, Saml. P.\* Specimen of Cave Earth (fertilizer), exported to United States. Fertilizer.

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\* For presentation to the Smithsonian Institution, Washington.



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**B E R M U D A S .**

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COMMISSION FROM BERMUDAS  
TO THE  
INTERNATIONAL EXHIBITION, PHILADELPHIA, 1876.

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HIS HONOUR THOMAS L. WOOD, Chief Justice, President.  
HON. HENRY FOWLER, Receiver-General.  
LIEUTENANT-COLONEL BLAND, R.E.  
JAMES TUCKER, Esq., Colonial Secretary, and Honorary  
Secretary.  
CAPTAIN LOCKHART, R.A., A.D.C.

*Assistant Commissioners.*

MAJOR WILKINSON.	H. J. HINSON, Esq., <sup>1</sup> M.D.
A. H. FRAZER LEFROY, Esq.	J. B. HEYL, Esq.
W. S. BARR, Esq.	C. C. KEANE, Esq.

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*Resident Commissioner at Philadelphia.*

A. A. OUTERBRIDGE, Esq.

## BERMUDAS.

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At an Exhibition where the richest and most attractive products of the world are displayed, it is not to be expected that the Bermudas, almost the smallest in extent of the Colonial possessions of the British Crown, can supply much matter worthy of notice. It is, however, the object of these few lines to draw the attention of the passing stranger to those points of interest to which they may fairly lay claim. Preliminary remarks.

The position of these islands in mid-Atlantic makes them of necessity one of the most important maritime stations on the globe. To this circumstance of their geographical situation in the midst of a comparatively warm body of water are also due such physical phenomena as render the Bermudas interesting in (among others) the following particulars:— Important position as a maritime station.

*Natural beauty.*—A glance at the map, an enlarged copy of which was exhibited in the Bermuda Court, will show the character of the Colony so far as the distribution of land and water is concerned. A chain of islets of irregular shape, with large inland basins, affords endless modifications of sea-shore scenery, occasionally precipitous and abrupt: a perpetual alternation of hill and valley imparts variety of aspect; and, though there are few, if any, features of sublimity in the scenery, water and sky of singular purity and softness of colour, and the general accessories of sea-side landscape in a semi-tropical country, with habitations of an antiquated character peeping out from amidst redundant vegetation, give Bermuda a place amongst the more attractive spots of the earth's surface. Natural features.

*Climate.*—From its geographical position within the temperate zone, and yet surrounded by an expanse of ocean of a comparatively high surface temperature—rarely below 62°, sometimes as high as 82° Fahrenheit—Bermuda has a climate varying less in actual range of the thermometer than is to be found in any other spot, not insular, situated without the tropics; being, in that respect, nearly on a par with Madeira. It has an equable temperature, varying in the colder months from 55° to 70° Fahrenheit; and the summer and early autumn, although oppressive from the moisture of a prevailing tropical wind, are of but comparatively short duration. For seven months of the year Bermuda has a climate singularly free from violent alternations of temperature and trying extremes, and, though liable to some fluctuation, almost always genial and bland. Equable climate.

The following table, compiled by his Excellency Major-General Sir John Lefroy, C.B., K.C.M.G., F.R.S., is inserted to show that the winter temperatures of Bermuda occupy a middle place between those of other famous resorts for invalids. They differ but little from the winter temperatures of Madeira as compared with Cuba and Nassau, they are materially less relaxing. As compared with Nice, Mentone, Algiers, and the Nile, materially more genial. In fact, Madeira, Bermuda, and St. Augustine, in different degrees, appear to unite the advantages of all the others in this particular. It is only in its humidity that it compares unfavourably with Continental stations; it is only invalids for whom a very dry air is recommended, that may be disappointed in resorting to Bermuda in winter. Nearly on a par with Madeira.  
  
For seven months.  
  
Table showing temperature as compared with nine other health resorts.

COMPARATIVE TABLE.

	Cuba, Havana.	Nassau.	Bermuda.	Madeira.	St. Augustine, Florida.	Cairo.	Algiers.	Mentone.	Nice.
I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
July . . .	81·5	82·1	80·0	70·1	82·8	85·8	75·2	75·0	73·0
August . . .	81·6	81·7	81·7	70·9	82·7	85·8	76·5	75·0	73·9
September . . .	80·4	81·1	79·8	70·9	80·2	79·2	73·2	69·0	69·2
October . . .	78·8	77·3	73·7	68·7	73·8	72·3	68·5	64·0	61·6
November . . .	75·1	74·8	68·0	65·0	63·5	63·0	61·9	54·0	53·8
December . . .	73·5	73·4	64·5	62·6	60·9	61·3	55·1	49·0	47·0
January . . .	71·4	70·5	63·4	61·9	60·7	58·1	53·0	48·2	44·5
February . . .	74·0	71·5	63·0	62·7	65·0	56·1	54·8	48·5	47·5
March . . .	74·1	72·4	63·4	64·0	67·5	64·6	56·0	52·0	50·6
April . . .	76·6	75·0	66·5	67·1	70·1	77·9	59·0	57·2	54·8
May . . .	78·0	78·3	70·4	68·4	76·9	78·3	66·3	63·0	62·3
June . . .	81·0	81·1	76·0	68·2	81·4	83·7	71·5	70·0	68·6
Mean annual . . .	77·2	76·6	70·9	67·3	72·1	72·2	64·3	60·4	58·9

II, VI, VII, VIII, X, Dove's Temperature Tables, 1848. IV, Governor Lefroy. V, IX, The Climate and Resources of Madeira, by Michael C. Graham, M.D., 1870. III, British Army Medical Department, 10 years, 1855-64.

General  
salubrity.

*Salubrity.*—It is a point worth bearing in mind, that the Bermudas are eminently healthy. From most of the ordinary ills which pervade large communities they are free. A porous sub-soil and free currents of air prevent or dissipate *malaria*. Nor, if we except occasional visitations of yellow fever presumably arising from preventable causes, and prevailing only at long intervals during or immediately after the extreme heats of summer, is there any fever of a local character. Cholera and diphtheria have never appeared; skin diseases are almost unknown. Acute inflammatory diseases assume a milder form, and yield more readily to treatment. Children are healthy. Practical experience shows that weakly invalids from more extreme climates acquire strength during the winter months. Old age—even very old age—is common. It is difficult to suggest why (except in the summer months) Bermuda should be other than extremely favourable to health.

General  
description.

*Situation.*—Bermudas, or Somers' Islands, is a cluster of about 100 small islands, situated on the western side of the Atlantic Ocean, in lat. 32° 15' N. and long. 64° 51' W. The exact situation of Bermuda Lighthouse (erected in 1846 on the highest land in the colony, the light being 362 feet above the sea, and visible at more than 30 miles distance) is in lat. 32° 15' 4" N., and long. 64° 51' 36" W. It is distant from Cape Hatteras, the nearest point of the Continent of America, 580 nautical miles; from New York about 640; from Halifax 800; and from St. Thomas about the same.

Fifteen or sixteen of these islands are inhabited; the rest are of inconsiderable size, the largest, or Bermuda proper, containing less than 20 square miles of land, and nowhere exceeding three miles in breadth.

Harbours.

*Dimensions.*—The islands extend from N.E. to S.W. in a curved line bending inwards at both extremities, so as to enclose spacious and secure harbours; the extreme length from end to end of the entire group being about 26 miles, and the average breadth of the principal island is about 1½ miles.

Islands.

Besides the main island, on which the town of Hamilton, the present seat of Government, is situated, the principal islands are St. George's, where the ancient town of St. George, the former capital, stands; Ireland Island, where the dockyard is established; Boaz and Watford Islands, occupied entirely by a military detachment, formerly a convict establishment; Somerset, St. David's, Smith's, Cooper's, Nonsuch, Godet's, Port's, and River's. With the exception of one break between Somerset and Watford Islands, there is continuous communication by bridges from St. George's to Ireland Island.

**Discovery and Settlement.**—The islands derive their name from Bermudez, a Spaniard, who sighted them in 1527. The earliest account of them is given by Henry May, who was cast away upon them in 1593. They were first colonized by Admiral Sir George Somers, who was shipwrecked there in 1609, on his way to Virginia. On his report the Virginia Company claimed them, and obtained a charter for them from James I. in 1612. This company sold their rights for 2,000*l.* to an association of 120 persons, who obtained a new charter in 1616, incorporating them as the Bermuda Company, and granting them very extensive powers and privileges.

**Constitution.**—This is the same as that which primarily prevailed in most other colonies settled early in the seventeenth century, and consists of a Legislature comprising a Governor and Legislative Council nominated by the Crown, and an assembly elected by the people. The Governor is assisted in the discharge of executive duties by a Privy Council, identical with the higher chamber of legislature.

Representative government was introduced in 1620. In 1621 the Bermuda Company in London made a Body of Ordinances for the Government of the Colony. During the civil war, great numbers of emigrants from England were attracted thither by the favourable reports of the climate and soil. Towards the end of the reign of Charles II., grave complaints were made by the inhabitants of the misgovernment of the plantation by the Company; and its character was annulled by process of *quo warranto*, at Westminster, in 1684–85. Since then the governors have been appointed by the Crown, and laws for the colony enacted by a local legislature, consisting of the Governor, Council, and Assembly.

The lands belonging to the Company were forfeited to the Crown on the annulment of their charter, and with the exception of some reserved for public uses, were granted in 1759 to purchasers on small quit-rents, extinguishable on the payment of a fixed sum of money.

During the Revolutionary War in North America the inhabitants suffered great privations from the scarcity of food; and although they export largely certain articles of agricultural produce, especially potatoes, onions, tomatoes, and arrowroot, they are still dependent on foreign supplies for all the flour and most of the meat consumed.

In 1784 a printing-press was introduced.

Early in the present century the importance of the Bermudas as a naval station came to be recognized. Ireland Island was purchased exclusively by the government, and a dockyard established there. By Order in Council, dated June 23, 1824, the Bermudas were declared a place where male convicts might be kept at hard labour on the public works; but these islands never were made a penal settlement, strictly speaking, where convicts might be discharged. The establishment was broken up in 1863.

On the abolition of slavery in 1834, the system of temporary apprenticeship of the emancipated slaves, permitted by the Act of Parliament in the slaveholding colonies, was dispensed with by the local legislature of Bermuda, so as to entitle the slaves to their absolute freedom six years sooner than was required by Parliament. They and their descendants now form more than a numerical half of the entire population.

**Geological formation and soil.**—Without hazarding speculation as to the origin of the mountain peak whose summit forms the Bermudas, by volcanic upheaval or otherwise, it is sufficient to say that all that can be seen belongs to the newest of geological formations. To a depth at least of fifty feet below low-water mark it is wholly composed of limestone of variable hardness, the basis of which is comminuted shell and coral, or other organic animal matter of marine origin, the surface soil either a *detritus* from these rocks, or a peculiar red soil of great natural fertility, the origin of which is open to much conjecture.

**Animal Kingdom.**—The Bermudas may be said to have had, when first discovered, no native animals. Those since introduced are of the ordinary domestic species. In sea birds, on the contrary, it was very rich; and besides nine or ten varieties of land birds that still build there, the islands are visited every year by a very large number of migratory birds; in all about 135 species have been killed. The most noticeable residents are the Red-bird or Cardinal Grosbeak; the Blue-bird, or *Scialia Wilsoni*; the white-eyed Vireo

Marine animal life.

Fishes—various species.

called "Chick of the Village;" the Cat-bird, *Mimus Carolinensis*; and the Ground Dove, *Columba passerina*. Marine animal life is varied and abundant, as was attested by the corals and sponges exhibited. The beautiful actinea could not be shown. Some of the fishes appeared in the Aquarium Department, including the beautiful Angel Fish, the Parrot Fish, the Butterfly Fish, the sea turbot, and others of strange forms or gaudy colours.

Fruits—tropical, sub-tropical, and temperate.

**Vegetable Kingdom.**—Bermuda can produce many of the fruits of both tropical and temperate climates. Strawberries, although little cultivated, bear well in the cool months. The fruits, which in their seasons are tolerably abundant, are oranges and lemons, avocado pears, loquats, litchis, the Surinam cherry (a *Eugenia*), figs, grapes, pomegranates, bananas, sugar apples, chirimoyas, mangos, sweet and sour sops, sugar-cane, and melons. But many of them are only grown in private gardens, and not generally attainable. Of timber, the indigenous Cedar predominates, much resembling the Virginia Red Cedar; but the stranger, in winter, is attracted by the great beauty of the *Poinsettia*, and in the summer by the "Queen of the Shrubs" (*Lagerstromia*), the *Poinciana*, numerous *Erythinas*, and the profusion of *Oleanders* of many tints, sometimes twenty feet high, which form the common fence of the country. Many of the palm species will also attract his attention—the *Palmetto*, the *Sago Palm*, not frequently a *Cocoa-Nut* or *Cabbage Palm*, and the *Thorny Gru-gru Palm*.

Palms.

Arrowroot.

To say that the Arrowroot of Bermuda enjoys the highest reputation, and that Bermuda chiefly supplies the market of New York with early potatoes, onions, and tomatoes, is scarcely necessary.

Notable works and natural features.

**Topography.**—There are two principal towns, Hamilton and St. George's; one government floating dock of great capacity, and a private dock or slip, several forts, and two principal stations for military, a dockyard, a first-class lighthouse, a lunatic asylum, and jails, a large hotel, with public offices and local edifices, as churches, chapels, and schoolhouses of the usual kind. There are ornamental grounds at Government and Admiralty Houses, and several well-known caves, and spots commanding extensive and picturesque views. A public library was established in 1839. In 1871 the Island of St. George's was connected with the main island by a causeway and road two miles in length, commenced in 1866, and completed at a cost of nearly 30,000*l*. An iron girder swing-bridge still permits the passage of vessels.

Boats and boatmen.

**Boats and Boatmen.**—In a group of islands where water communication is constant, sailing boats and a population inured to sea-faring habits are naturally to be found. Bermudians are not only good sailors, but they acquire habits of dexterity and accuracy of eye and judgment amidst breakers in heavy weather which are remarkable; while their form of boat—a model of which was exhibited—was well known as combining all the points which enable it successfully to navigate inland waters and tortuous passages in all weathers. Great comparative breadth of beam secures rapidity in turning; simplicity of rig, handiness in management; the form of mainsail (a leg-of-mutton sail with a boom), closeness of sailing when on a wind, and depth of keel combined with much ballast, stiffness under canvas, security in stays, and trifling loss by lee-way.

Population in 1871.

**Population.**—By the last Census in 1871 the population was found to be as follows:—

	White.	Coloured.	Total.
Males - - -	2,118	3,284	5,402
Females - - -	2,607	4,112	6,719
	4,725	7,396	12,121
Military and Naval Department - - -	-	-	305
Total Bermudian Population - - -	-	-	12,426

## From Naval and Military Returns :—

			Males.	Females.
Naval	-	-	316	202
Military	-	-	2,125	545
Totals	-	-	2,441	747

Grand Total of all persons then resident in Bermuda - 15,614

From this we find that of the Bermudian population proper, women are to men in the proportion of about six to five. The Coloured Population to the Whites as about three to two. If the Naval and Military are added to the Bermudian population, the White is in excess of the Coloured Population, and men of women. To the total resident population of Bermuda from all sources we may add occasional visitors and sailors from ships of war—the latter, at certain seasons, very numerous, raising the total population of Bermuda from all sources, at times, to over 17,000 persons.

Proportion of women to men, as 6 to 5.

DESCRIPTIVE CATALOGUE of the COLLECTION sent from the BERMUDAS to the CENTENNIAL EXHIBITION of 1876 at PHILADELPHIA.

*P* signifies Award for Exhibit.

(The Government of the Bermudas received also an award for its Collective Exhibit).

MINERALS, ORES, STONE, AND MINING PRODUCTS.

- Cl. 100. *Government of Bermudas*.—The top of a Pillar of Stalagmite, taken from the floor of a Submerged Cave about  $2\frac{1}{2}$  feet below low-water mark.  
A small Stalactite taken from the roof of the same cave, where the top was also submerged below low-water mark.  
These were exhibited in evidence of the gradual subsidence by the operation of which the floors of nearly all the caves are somewhere below low-water mark.
- Cl. 102. *P Ness, Ph.*—An assortment of Building Stones of various qualities.  
A. Hard Stone containing some fossil shells, chiefly used in military works, and for road-making. B. Bastard Stone, less hard. C. Soft Building Stone, such as is commonly worked with a hand-saw, but hardens a little on exposure. They only differ in the degree to which the grains of sand are cemented by the infiltration of carbonate of lime in solution.

FURNITURE, AND OBJECTS OF GENERAL USE IN CONSTRUCTION AND IN BUILDINGS.

- Cl. 217. *Bermuda, Government of*.—Two Inlaid Tables, Bermuda wood and workmanship.

CLOTHING, JEWELLERY, AND ORNAMENTS.

- Cl. 251, 254. *Trimingham, J.*—Bermuda Straw Plait, Bonnets, &c. Wreath of shell work. Palmetto Plait, and articles made from the Palmetto Leaf.
- Cl. 252. *Middleton, T. D.*—Articles in Point Lace, Somerset Island.
- Cl. 252. *Smith, Mrs. R. T.*—Fine Point Lace.
- Cl. 252. *Ness, Miss.*—Point Lace sleeveless basque. Point Lace sofa pillow.
- Cl. 252. *Lines, Mrs.*—Point Lace.
- Cl. 254. *Bermuda, Government of*.—Walking Canes from the exterior of the Gru-gru palm (*Astrocaryum Aureum*) Cedar and other walking canes.

MEDICINE, SURGERY, PROTHESIS.

- Cl. 272. *Hugh, J. B.*—Medicinal Herbs and Drugs.

EDUCATIONAL SYSTEMS, METHODS, AND LIBRARIES.

- Cl. 300. *Education, Board of*.—School Map of the Bermudas.
- Cl. 306. *Thorpe, Mrs. W.*—"Afternoon in Bermuda."
- Cl. 306. *Wilkinson, Major H. J.*—"The Sand Hills."
- Cl. 306. *Asen.*—Bermuda Flowers from Nature.

## PHYSICAL, SOCIAL, AND MORAL CONDITION OF MAN.

- Cl. 312. *Bermuda, Government of.*—Examples of the Ancient Records of the Colony of Bermuda from 1616. Title Deeds, or Original Grants of land of the Bermuda Company, 1628-9. Fac-simile of the earliest published Map of Bermuda, from Norwood's Survey of 1616.

## ENGINEERING, ARCHITECTURE, MAPS, &amp;c.

- Cl. 335. *Bermuda, Government of.*—Large general Map of the Bermudas, details by Royal Engineers and Major Crawford, R.A.  
Cl. 335. Diagram showing the monthly mean temperature of Bermuda compared with other places of winter resort. Drawn by Lieut.-Col. Bland, R.E.

## PHOTOGRAPHY.

- Cl. 430. *Somerset, Col. Fitzroy, R.E.*—Photographs of Bermuda Scenery, by the Royal Engineers.  
Cl. 430. *Hugh, J. B.*—Photographs of Bermuda Scenery.

## AERIAL, PNEUMATIC, AND WATER TRANSPORTATION.

- Cl. 594. *Hinson, Dr., M.D.*—Model of a Bermuda Yacht, cutter-rigged, length of keel 4 ft. ; scale about  $\frac{1}{4}$ th.  
Cl. 596. *Admiralty, Lords of the.*—Model of Her Majesty's Floating Dock at Bermuda. Sectional drawing of ditto.

## ARBORICULTURE AND FOREST PRODUCTS.

- Cl. 600. *Several Contributors.*—Sections and Specimens of Woods.  
Cl. 601. *Astwood, Mrs.*—Bird's Eye Cedar, and other Ornamental Woods.

## POMOLOGY.

- Cl. 611. *Committee, The.*—Bananas and other fruits. (Forwarded at the proper season.)

## ESCULENT VEGETABLES, ROOTS, AND TUBERS.

- Cl. 621, 622. Bermuda Tomatoes. American seed.  
Cl. 622. Bermuda Onions, chiefly from Madeira seed, modified by climate.  
Cl. 622. Bermuda Potatoes raised from Irish or American seed, but much modified by climate.

## MARINE ANIMALS, FISH CULTURE, AND APPARATUS.

- Cl. 641. *Bermuda, Government of.*—Collection of Live Fish.  
Cl. 645. Conch shells (*strombus gigas*) used by Cameo cutters. An extinct land shell of relatively large size. Sp. of Hyaline.

## ANIMAL AND VEGETABLE PRODUCTS.

- Cl. 650. *Bermuda, Government of.*—Sponges, Coral, Nullipores, and Coral-lines, Sea Fans (*Gorgonias*), Sea Rods (*Plexaura*).  
Cl. 656. *Hugh, J. B.*—Dried and Preserved Fruits.  
Cl. 658. *Tucher, Tho. Fowle.*—Arrowroot.  
Cl. 658. *Bertram, J. T.*—Arrowroot.—Tous les Mois. (Sent at the proper season.)  
Cl. 658. *Hayward, J. Wing.*—Arrowroot.

## TEXTILE SUBSTANCES OF ANIMAL OR VEGETABLE ORIGIN.

- Cl. 666. *Peniston, W.*—Fibre prepared from the leaves of *Fourcroya gigantea*.

## MACHINES, IMPLEMENTS, AND PROCESSES OF MANUFACTURE.

- Cl. 672. *Bermuda, Government of.*—Tools used in freeing the ground of the roots of Sage and Wild Mimosa.

## ORNAMENTAL TREES, SHRUBS, AND FLOWERS.

- Cl. 700. *Bermuda, Government of.*—Flowers, Ferns, and Ornamental Plants.

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**BRITISH GUIANA.**

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**THE PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**Superintended at Philadelphia by the BRITISH EXECUTIVE  
COMMISSIONERS.**

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## BRITISH GUIANA.

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THIS colony is a portion of the South American Continent, extending from east to west about 200 miles. It includes the settlements of Demerara, Essequibo, and Berbice. It is bounded on the east by Dutch Guiana, from which it is divided by the River Corentyn, on the south by Brazil, on the west by Venezuela, and on the north and north-east by the Atlantic Ocean.

The territory was first partially settled by the Dutch West India Company in 1580, and was from time to time held by Holland, France, and England. It was restored to the Dutch in 1802, but in the following year retaken by Great Britain, to whom it was finally ceded in 1814.

It is impossible to determine the exact area of the colony, as its precise boundaries are undetermined between Venezuela and Brazil respectively, but it has been computed to be 76,000 square miles.

Under the Dutch, Demerara and Essequibo constituted one Government, and Berbice another, which arrangement indeed continued in force under the British Administration down to the year 1831.

The constitution of British Guiana may be briefly described as follows. It consists of a Governor, appointed by the Crown, a Court of Policy, composed of five official and five elective members, and a Combined Court, composed of the Governor and members of the Court of Policy, with six financial representatives chosen by the electors. The functions of an Executive and Legislative Council and House of Assembly are performed by the Governor and Court of Policy, except as regards taxation and finance, which are dealt with by the Combined Court. The Court of Policy passes all laws and ordinances except the Annual Tax Ordinance, which is passed by the Combined Court.

The Roman Dutch Law is in force in civil cases, modified by Orders in Council and local ordinances; the Criminal Law is the same as that of Great Britain, and is administered in the same manner, except that there is not the intervention of a Grand Jury.

There were but two towns properly so called—Georgetown, the capital of the colony, on the Demerara river, and New Amsterdam, on the Berbice.

The cultivated part of the country lies along the sea coast and on the banks of the rivers. Cotton and coffee were formerly cultivated in considerable quantities, but of late very little attention has been given to these articles, all the resources of the colony being concentrated on the production of sugar and rum. There is also a considerable trade in timber.

The total population at the end of 1871 was 193,491, made up as follows:— Natives of British Guiana 113,570; of West India Islands 13,385; Madeira and Azores 7,925; of other places not specified 9,635. The remainder were immigrant coolies working on the plantations. From a return issued in 1874 it appears that there were then 38,597 under indenture, of whom 33,360 were Indians, 3,875 Chinese, and 362 Africans. In 1876 the population had increased to 216,000.

The aboriginal Indians were estimated in 1851 at about 7,000; but Mr. M'Clintock, Superintendent of Rivers and Creeks, an undoubted authority on the subject, carries the number as high as 20,000 or 21,000; the numbers of the tribes within the British territories vary, however, considerably, and are at all times very uncertain.

Area of island,  
and proportion  
undercultivation.  
Vegetable  
products.  
Rice.

Necessity of  
irrigation.

The area of the island is 24,702 square miles, or 15,809,280 acres, of which rather more than one-sixth is under cultivation. Rice, which forms an important element in the food of the native population of the island and of the adjoining continent of India, is, as might be supposed, the principal article of production. Large quantities of rice are now annually imported, but as the irrigation works undertaken by the Government become more and more extended, large districts, which from the remains that still exist of deserted villages, evidently supported in earlier times a large and thriving population, will again be brought into a state of fertility, and will limit if not altogether do away with the necessity for seeking a supply of this important article of food from outside the country.

Coffee.

Ceylon has also been found especially well adapted for the cultivation of coffee, which occupies the attention of a large proportion of the British residents and affords a good return for the capital employed. Coffee planting has been rapidly extended within recent years, and this has led to an entire opening up of the country by roads and railways. It is computed that over 290,000 acres are occupied by coffee plantations.

Grain, cocoa-nuts,  
cinnamon,  
tobacco, &c.

Other important productions are various grains other than rice, occupying about 100,000 acres, cocoa-nuts 26,000 acres, cinnamon 26,000 acres, tobacco 19,000 acres, and areca, palmyra, and other palms 60,000 acres.

Mineral pro-  
ductions.  
Plumbago.  
Exportation to  
Europe.  
Iron.

The minerals found in the colony are not numerous. The principal are—plumbago, which occurs in veins underlying quartz in the south and south-west, and has been exported in considerable quantities during the last few years, owing to the extensive European demand for crucibles, and iron, which exists in almost inexhaustible quantities on the surface in several districts of the island, both in the form of pyrites and in fused mixture, indicating volcanic action at some past period. Owing to the large and comparatively cheap introduction of English iron, and to the fact that coal, if it indeed exists at all in the colony, has not yet been discovered, the manufacture of articles of iron by the natives is extremely limited, being confined for the most part to small bars or implements for ordinary agriculture, such as rough knives and the like, which may be purchased in the native bazaars. Considerable skill is shown by the natives in the preparation of steel, which in the process of manufacture becomes unusually hard and close in texture, and is said to possess many of the properties which admitted of the exquisite tempering given in mediæval times to sword blades of eastern production.

Apparent  
absence of coal  
deposits.  
Iron manufac-  
ture very limited.

Preparation of  
steel.

Ironstone gravel is found in considerable quantities in various districts, and is used generally and with excellent effect in road-making.

Ironstone gravel  
used for road-  
making.

Woods.  
Sapan.  
Mililla.  
Halmilla.  
Cocoa-nut.

Ceylon possesses many valuable woods, suitable for building purposes and for the manufacture of articles of furniture. The principal are sapan, a red dyewood; mililla, a durable wood, and free from knots, used in bridge building and for beams generally; halmilla, very light and elastic, much used in the making of casks, for which purpose it is in great demand; cocoa-nut, the outer rind of the tree available for working up in small scantlings for furniture; areca-nut, very useful for long flexible spars for temporary purposes; satin, a well-known and exquisitely marked wood which makes most beautiful articles of furniture—it is also much used as planking for bridges, being exceedingly durable; ebony, a well-known wood, principally used for ornamental purposes; jack, a common but very useful wood—it is bright yellow when newly cut, but darkens to a rich mahogany colour on exposure and takes a beautiful polish; tulip, gnarled and knotty, but admirably adapted for naves of wheels, for which it is much used; teak, of quality, however, far inferior to that grown in Burmah, for which it is a very indifferent substitute; calamanda, a beautifully grained wood, used only for making costly furniture; and palmyra, very valuable for piling in salt water, where it has been known to stand for 30 years without protection.

Areca-nut.  
Satin.

Ebony.  
Jack.

Tulip.  
Teak.  
Calamanda.  
Palmyra.

Cotton.

Little cultivated.

An inferior variety of cotton appears to be indigenous, one species being so general and so prolific that it is considered one of the most troublesome weeds in the island. The cultivation of the better sort of cotton is not pursued on anything but a very limited scale, although there are large tracts of country of which the soil is remarkably well fitted for the production of cotton of admirable quality. It is believed that with liberal encouragement the growth of the finer sorts of cotton might be carried on practically without limit.

Capabilities of  
island for pro-  
ducing cotton.

The following is a statement of the Revenue and Expenditure for the Revenue and  
decennial period ending 1875 :— expenditure,  
1866 to 1875.

	<i>Revenue.</i>	<i>Expenditure.</i>
	£	£
1866 - - -	962,873	917,669
1867 - - -	969,936	927,932
1868 - - -	925,265	974,950
1869 - - -	946,494	881,373
1870 - - -	1,091,606	1,026,871
1871 - - -	1,121,679	1,064,184
1872 - - -	1,174,698	1,062,994
1873 - - -	1,290,918	1,176,258
1874 - - -	1,324,328	1,184,192
1875 - - -	1,444,398	1,301,525

The value of imports and exports has not shown any very considerable Trade.  
variation during the seven years preceding 1873, but there has been a marked  
increase in the three following years, as will be seen by the table appended.  
The aggregate tonnage of shipping entered inwards and cleared outwards during Shipping.  
the year 1875 was 1,129,219 and 1,087,184 tons respectively. A large increase Probable increase  
may be expected when the breakwater at Colombo, now in course of construc- in tonnage.  
tion, is finished.

	<i>Imports.</i>	<i>Exports.</i>
	£	£
1866 - - -	4,961,060	3,586,452
1867 - - -	4,504,338	3,530,224
1868 - - -	4,403,177	3,786,721
1869 - - -	4,635,023	3,631,065
1870 - - -	4,634,297	3,803,731
1871 - - -	4,797,952	3,604,853
1872 - - -	5,169,524	3,139,060
1873 - - -	5,574,538	5,439,591
1874 - - -	5,691,860	4,687,388
1875 - - -	5,718,655	5,733,770

Satisfactory progress is being made in education, the number of scholars Education.  
in schools aided and inspected by the Government having increased from  
6,879 in 1868 to 35,193 in 1875. The improvement is due to the institution  
of a Department of Public Instruction and the adoption of the system of pay-  
ment by results.

Great efforts have been made to keep pace with the growing requirements Means of com-  
of the colony as to facility of communication. The principal towns are munication.  
connected by telegraph. There is a railway 74 miles in length from Colombo  
to Kandy in the interior, and a branch line of 17 miles into the cotton districts ;  
while there are 905 miles of metalled roads and 529 miles and 922 miles  
respectively of gravelled and natural roads, exclusive of roads within municipal Roads.  
limits and minor roads not in the charge of the Department of Public Works.  
The cost of construction is great, and the subsequent expense of maintenance enormous, owing to climatic influences and the inferior quality of the metal available. To maintain in good order a mile of metal road costs on an average over 90*l.* per annum, and it has not unfrequently exceeded 200*l.*, where the traffic has been very heavy. Cost of road  
construction and  
maintenance.

As to means of communication with the outside world there is a fortnightly Steam commu-  
mail service carried on by the steamers of the Peninsula and Oriental Company nication,  
between Ceylon and European ports and Bombay on the one side, and Madras, Peninsula and  
Calcutta, the Straits Settlements, and China on the other ; also a monthly Oriental Com-  
service between Ceylon and Australia. The Messageries Maritimes Company pany, with  
has also a fortnightly mail service between Ceylon and Marseilles, and between Europe.  
Ceylon and Calcutta, the Straits Settlements, and China. The passage India, China,  
to Southampton generally occupies about 30 days, to Brindisi or Marseilles Straits Settle-  
23 or 24 days, and to Bombay, Madras, Calcutta, Singapore, and China, ments.  
4, 2, 6, 7, and 15 days respectively. Australia.  
Duration of  
passage.

There is besides weekly communication with ports in India by the steamers Weekly sailing  
of the British India Steam Navigation Company, which leave Colombo at from Colombo  
regular intervals for Bombay and Calcutta, calling at intermediate ports. to Indian ports.

Public debt.  
Rate of interest  
payable.  
Amount of  
sinking fund  
available in re-  
payment of debt.

The public debt in January 1877 amounted to 798,719*l.*, made up of money borrowed chiefly for the construction of public works at interest varying from 6 to 3½ per cent. The amount of the sinking fund applicable to the payment of the 6 per cent. debentures was, in November 1876, 370,619*l.*

The above account of the colony is mainly taken from the Colonial Office List for 1877, and from the able paper on the British Colonies, contributed by Mr. (now Governor) Robinson to the Official Report of the Commissioners for the Vienna Exhibition of 1873.

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*P signifies Award for Exhibit.*

(The Government of Ceylon received an award for Collective Exhibit.)

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#### MINERALS, MANUFACTURES, EDUCATION, ART, AGRICULTURE.

##### MINERALS, ORES, STONE, MINING PRODUCTS.

Armitage Bros., Colombo.—Tin and plumbago.

*P* Delmege, Reid, & Co., Colombo.—Graphite, raw and prepared.

##### CLOTHING, JEWELLERY AND ORNAMENTS, TRAVELLING EQUIPMENTS.

Armitage Bros., Colombo.

*a.* Straw hats.

*b.* Canes.

##### FABRICS OF VEGETABLE, ANIMAL, OR MINERAL MATERIALS.

Armitage Bros., Colombo.

*a.* India-rubber.

*b.* Ropes.

##### EDUCATIONAL SYSTEMS, METHODS, AND LIBRARIES.

Armitage Bros., Colombo.—Almanacs and other books.

##### SCULPTURE.

Armitage Bros., Colombo.—Elephant, carved in plumbago.

##### PHOTOGRAPHY.

Armitage Bros., Colombo.—Photographs.

##### ARBORICULTURE AND FOREST PRODUCTS.

Armitage Bros., Colombo.

*a.* Woods.

*b.* Dye woods.

*c.* Gutta-percha and gums.

##### AGRICULTURAL PRODUCTS.

Armitage Bros., Colombo.

*a.* Coffee, spices, tobacco, and cigars.

*b.* Seeds.

##### WATER ANIMALS; FISH CULTURE AND APPARATUS.

Armitage Bros., Colombo.—Mother-of-pearl and other shells.

##### ANIMAL AND VEGETABLE PRODUCTS.

Armitage Bros., Colombo.

*a.* Coco de Mer.

*b.* Vegetable tallow.

*c.* Tapioca.

*d.* Sugars.

##### TEXTILE SUBSTANCES OF VEGETABLE OR ANIMAL ORIGIN.

Armitage Bros., Colombo.

*a.* Cotton.

*b.* Fibres.

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**GOLD COAST COLONY.**

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**THE PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**Manager at Cape Coast of the Collection, W. MELTON, ESQ.**

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**Superintended at Philadelphia by the BRITISH EXECUTIVE  
COMMISSIONERS.**

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**Agents, MESSRS. PETER WRIGHT AND SONS, 307, Walnut  
Street, Philadelphia.**

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## THE GOLD COAST COLONY.

THE Gold Coast Colony extends from 4° 9' E., including Jaboo or Leekie and Palma, which skirt the seaboard, the Island of Lagos within the Lagoon, the approach to which lies through a dangerous and shifting bar, and Badagry on the Lagoon, running in a westerly direction, lying between 2° 50' 55" E., where British territory ends, and formed the western boundary of the Settlement of Lagos and its Dependencies until 1874, when it was incorporated with the Gold Coast Colony. The line of coast lying between 2° 50' E. and 1° 12' E., comprising Porto Novo, Cutlanu, Godomy, Whydah, Great Popo, Agweh, Little Popo, and Porto Seguro to 1° 12', a little to the west of Flowhow, constitutes the division between Badagry and Flowhow, and is not a part of the Gold Coast Colony.

Geographical position.

Flowhow is the easternmost point of the Lagoon, which has its outlet at the mouth of the Volta. Between Flowhow and the Volta is the British Fort of Quittah, whose district is comprised within these limits, exercising jurisdiction on the Lagoon, which runs at the back of Quittah and communicates with the Volta and several other places in the interior. A little to the westward of Quittah is the trading port of Jellah Coffee, the emporium for live stock on this part of the coast. The next place of importance on the Volta is Addah, near its entrance, the entrepôt for trade with the interior as far as Sallagha, but owing to high rocks the river is only navigable for small craft as far as Amedica.

Flowhow.

Quittah.

Jellah Coffee.  
Volta-Addah.

Following the coast to the westward are the trading places of Ningo and Pram-Pram. Accra, the future seat of Government, and, next to Lagos, the most important place of trade of the Colony, contributing about 20,000*l.* a year to the colonial revenue, lies in a flat country some 60 feet above the level of the sea. The other places of consequence are Winnebah, near the River Aginsue, Salt Pond, a place of considerable trade in palm oil, and Anamaboe within about 12 miles of the present head quarters of the Government, Cape Coast Castle.

Ningo and  
Pram-Pram.  
Accra.

Winnebah.

Cape Coast  
Castle.

Eight miles beyond Cape Coast Castle is Elmina with its fine castle of St. George situate near the River Benyan, and formerly the chief settlement of the Dutch Government, transferred, together with all their settlements on the coast of Guinea, to the British Government. Near Chama is the celebrated River Prah, on which at Prahsue a force of Houssas is maintained not only for the protection of the surrounding country, and as a check upon the introduction of slaves from Coomassie, but also for a political object. Beyond Chama is Secondee, transferred by the Dutch, and the old English settlement of Dixcove. The last place of note is Axim, the western boundary of the Gold Coast Colony.

Elmina.

Chama.

Secondee.

Dixcove.

Axim.

The climate varies according to locality and its surroundings.

At Lagos the climate is very unhealthy and oppressive during the dry season, when the heat is great, causing the European residents to become pale, thin, and haggard. In the wet season, when the temperature is much reduced, Europeans are subject to fever, ague, and dysentery; but for those who are fortunate enough to escape or recover from these attacks, the climate for August, September, and October is not unpleasant, the sky being overcast, and fresh sea breezes prevailing in the afternoon, when the residents pick up in flesh and colour. Still at Lagos from the flatness of its site, and being only slightly elevated above the sea, the defective sanitary arrangements, and the almost insuperable difficulty of successfully handling the subject with a population estimated at 60,000 souls living chiefly upon vegetable food, will always cause a deleterious effect upon the health of the Settlement. Relief however is experienced by the sea breeze in the afternoon which tends to drive away the poisonous exhalations. Lagos is however abundantly supplied with fresh water, obtainable from the public wells and private springs.

Climate at  
Lagos.

Water supply.

- At Accra. To windward the temperature decreases, and although Accra is considered to be the most healthy of all the settlements, yet fresh water and fuel are scarce.
- Akropong. North and north-west of Accra is Akropong, 1,600 feet above the level of the sea, where the Basle Mission has its head quarters, and where, says Sir J. D. Hay, "the European may recover in its balmy shades and cool breezes the energy he has lost in the plains below."
- At Cape Coast. At Cape Coast where the thermometer ranges from 72° to 85° the climate is most unhealthy; and from its proximity to the sea exceedingly humid, particularly in the months of July, August, and September. The numerous hills surrounding the town interfering in some measure with a free current of air, the rapid growth of bush and its decay in the hollows or valleys at the base of the hills, all tend to make Cape Coast one of the most unhealthy settlements of the Gold Coast Colony, and the climate perhaps the most depressing. Water is scarce, the inhabitants depending upon supplies of an indifferent quality obtained chiefly from the wells at Catocraba, a short distance from the town, and rain water collected in the tanks of the houses of the well-to-do inhabitants.
- Scarcity of water. During the last three or four years an apparatus for condensing sea water has been set up about a mile from the town, and the fresh water produced and distributed daily to government officials to the extent of five gallons per head is one of the greatest boons that could have been conferred upon them, as, in the opinion of the acting Colonial Surgeon, it has prevented dysentery, at one time the scourge of Cape Coast.
- Apparatus for condensing the water. It has been in contemplation to supply Cape Coast with fresh water from the Sweet River between Cape Coast and Elmina by means of an aqueduct.
- At Elmina. Elmina is considered in point of health better than Cape Coast, and there can be no question as to its eligibility as a place of residence, being infinitely superior to Cape Coast, although it has yielded the palm to its eastern rival Accra. The unhealthiness of Dixcove is said to be attributable to a swamp in which sacred crocodiles live, near the town. Secondee is built on a rocky amphitheatre, and presumably healthy. Axim is well watered, and said to be the most healthy part of the coast, and the town to be the cleanest.
- At Dixcove. The soil is generally rich, producing in abundance fine timber, palm oil trees, guinea grains, of which 151,783 lbs. were exported in 1875, Indian corn, yams, cassada, sweet potatoes, ground nuts, sweet nuts, sugar cane, cocoanuts of which 46,596 were exported in 1875, and of the dried nut 148,013 lbs. ditto, bennie seed, cotton, coffee, oranges, limes, tomatoes, ginger, indigo, in fact there is no limit to its capability of production.
- At Secondee. The timber tree commonly called Odoom abounds all along the coast. It is used for house building and cabinet work, and according to Gramberg, in his West Coast, Africa, the forests on the banks of the Prah formerly produced a great deal of timber for building the West India Company's ships, and still produce beautiful timber for ship building and furniture. There are numerous silk cotton trees, "*Bombax ceiba*," from which canoes, stools, and wooden wares are made.
- At Axim. From the publicity that has recently been given to the Liberian coffee tree it is expected that it will be shortly introduced into the colony on a large scale, it being "a prodigious cropper" (34 lbs. having been obtained in one season at Accra from a single tree) and the quality equal to the finest sorts. The cocoanut abounds along the whole coast, and the dried nut known as capprah figures in the exports of the colony. Gum copal is obtained from the forests, and is chiefly bought up by the Americans, the quantity exported in 1875 was 178,832 lbs.
- Soil. The gold dust is found chiefly in the Warsaw country, and is dug from pits mixed with earth, and then washed in black dyed bowls; but the quantity that is mostly brought to Cape Coast is found in countries to the north of Ashantee, where it changes hands, the original producers not being allowed to communicate and trade with the seaboard direct, by the jealous Ashantees.
- Timber trees. The cattle in the country are small and sparsely distributed, sheep being the chief domestic animal, and when well fed make excellent mutton. Pigs thrive. Goats are common, but of small size. Turkeys, ducks, and fowls are abundant on the Gold Coast, and the market of Lagos is well supplied besides these with Guinea fowl and pigeons.
- Coffee tree. The chief wild animals are the leopard, hyena, and the numerous tribe of the smaller "*Felidé*." The black monkey is plentiful in the forests in the
- Cocoanut. Gum copal.
- Gold dust.
- Cattle.
- Wild animals.

interior, and their skins, the hair of which is long, black, soft, and silky, of the best kinds, are an article of trade, the exports in 1875 being 16,253 skins. Porcupines are common—their flesh is a *bonnebouche*, and of their quills 80,841 were exported in 1875. The elephant is nearly extinct about this part of the coast. Bosman, in his description of Guinea written about 150 years ago, says that they used to visit the gardens of the settlers on the coast. There are some fine bucks occasionally shot near, and brought into Cape Coast; also at Accra, where a small species of the pet antelope called the *fillentambo* is common.

From preserved specimens that have been exhibited, birds of the most Birds. beautiful plumage exist in the interior. Parrots are taken in great quantities, and disposed of to the mail steamers at about 5s. each; 2,135 were shipped in 1875.

The large snail, probably a species of "*Pleckocheilus undulatus*," is found in Snails. immense quantities in the forests, and largely contributes to the food of the natives.

Some of the Coleoptera are of the size of a small flattened hen's egg, white Coleoptera. on the upper surface and black underneath, whilst the black scorpions resemble young lobsters. Their tails are armed with a point resembling the thorn of the rose, through which the poison is expelled when striking a blow in a curved direction over their vertebra, and they are extremely tenacious of life. Snakes abound in the brushwood, the bite of some of which is Snakes. venomous.

The Government of the Gold Coast Colony is administered by a Governor Government. and Commander-in-Chief who resides at Cape Coast, and a Lieutenant-Governor who resides at Lagos, assisted by a Legislative and Executive Council.

The Government of the Colony received an award at the Philadelphia International Exhibition for its Collective Exhibit.

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## THE ISLAND OF LAGOS.

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At a short distance from the entrance to the bar is the signal station, provided with a flag staff and a heavy signal gun. Having crossed the bar in one of the small steamers belonging to the port, the first objects that greet the eye are the private coal sheds on the west side of the island, where the local steamers coal, there being a considerable depth of water close in shore. Then we have the gunpowder magazine, the debtors prison, hospital, and gaol. Here the Marina, about two miles long, having an excellent carriage road, the sides being planted with mangoe and umbrella trees, and the slopes with Bahama grass may be said to commence.

Situation and description.

The Marina boasts of some fine houses, several of which have gardens in front, planted with the choicest imported flowers. The missionaries, who were among the first comers, secured extensive frontages. The Wesleyan Society have erected on theirs a commodious lofty and airy dwelling-house, and recently a large school. Government House is enclosed by iron gates, and approached through a lawn on either side, at the rear of which is fine stabling and the Colonial Engineers' yard.

Very little can be said of Government House. It is chiefly built of wood, and lacks comfort and accommodation. There is a large flag mast near the entrance, and signals are interchanged with the vessels in the roadstead.

Adjoining Government grounds, the Church Missionary Society possess a large grant of land, on which stands the original mission house built of wood, and a fine lofty capacious structure of brick, where a boarding and educational establishment for young ladies is carried on. On the same plot of land stands the handsome brick-built Christ Church, with its clock tower, also erected by

the Church Missionary Society, and is one of the most striking objects after crossing the bar. It is lofty, well ventilated, fitted up with sittings, made of the celebrated Odoo wood, varnished and adorned with stained glass windows. It possesses a fine harmonium, with a choir of 40 persons, whose performance is doubtless unequalled on the coast. At the rear of the church is a shop attached to the missionary establishment devoted to the sale of religious and general literature, &c. The Church Missionary Society have recently erected on their land and the back on the other side of Broad Street, an extensive establishment for the training of young men for the ministry. The Catholics have also an educational and ecclesiastical establishment and a convent.

We now approach the Treasury, Custom House, and Post Offices, near to which is the magnificent and capacious customs warehouse, communicating with the Government wharf, opposite where all goods are generally landed that are brought over the bar from the mail steamers, &c. After leaving Christ Church, the Marina declines considerably until it reaches the north-western end of the island. All along the Marina are the merchants establishments and several private wharves. The other principal streets are Broad Street, Victoria Street, and Olowogbowo, where there are some good houses and several other churches, and chapels. The Mahomedans have a mosque built of brick. In Tinibu Square stands the Court House, a large and lofty building which has lately been remodelled and rebuilt.

The native houses are generally built of mud one storey high and thatched with palm leaves. Extensive fires are frequent, and commonly it is believed the work of incendiaries, a mode of revenge or injury adopted by the native people. During the last three or four years, however, the use of galvanized iron roofing has come much into use.

The arrival and departure of shipping, the constant movements of the local steamers, and the fleet of cargo bar boats, the special market days named after the places from which produce is brought as "Porto Novo market day," &c., the influx of strangers with their large canoes laden with produce from the interior, the varieties of costume, the shades of colour of the different tribes, their peculiar mode of salutation, consisting of genuflexions, clasping the knees and feet, and in some cases extending their bodies full length on the ground, the signal gun indicating the arrival of the mail steamers, although it announces the capsizing of a bar boat on the bar with loss of life, the interchange of signals, the performance of the band, the croquet parties, lawn tennis, cricket, boating, the numerous horses and carriages, billiards, and reading at the club room, balls, musical entertainments, lectures, &c., and the annual races round the race course, where a large and substantial stand has been erected, all combine to make Lagos perhaps the most lively, social, and busiest place on the coast. The educated natives and Europeans meet on an equal footing, all distinction of colour being disregarded.

#### Population.

The population is estimated at 60,000 souls, composed of various tribes, chiefly Yoruba "emancipadoes" from the Brazils, Sierra-Leoneans, and others, besides 89 Europeans males and 5 females. The inhabitants are all industrious, and well-to-do, and nearly every native woman is robed in a couple of native dyed cloths, the produce generally of the Niger.

A reference to the Tabular statements will show the extent and variety of the Lagos trade, and from its numerous water ramifications it is admirably situated for trade and developing the resources of the countries around, and in the interior Lagos well merits the title that has been bestowed upon her as "The Liverpool of Western Africa;" of her exports, palm kernels stand preëminent, and a few remarks respecting this staple which has given such an impetus to the industry of the people may not be uninteresting.

The shell of every kernel is separately broken with a stone. For those who may feel disposed to pursue the calculation of the aggregate expenditure of force required to produce 26,456 tons of palm kernels the quantity exported from Lagos last year, they are informed that there are 522 kernels or almonds divested of their shell in a pound weight avoirdupois, and that it requires a stone or other hard substance of at least a quarter of a pound weight to be lifted three inches high to liberate by concussion each kernel from its shell.

## COMPARATIVE STATEMENT.

Comparative  
statement of  
revenue and  
expenditure.

## LAGOS.

1874 Revenue	-	£ 39,350	Expenditure	-	-	£ 37,296
1875 „	-	£ 43,367	„	-	-	£ 34,380
1874 Imports	-	£ 384,636	Exports	-	-	£ 486,227
1875 „	-	£ 459,736	„	-	-	£ 517,555

## RETURN OF PRODUCE, &amp;c.,

Return of  
produce.

Imported into the town of Lagos for the year 1874.

Bennie Seed	-	-	-	tons	27
Black oil (native made palm kernel oil)	-	-	-	gallons, O.M.	5,440
Bullocks	-	-	-	-	978
Calabashes	-	-	-	packages	6,671
Corn, Indian	-	-	-	bags	39,939
Corn flour	-	-	-	„	1,321
Cotton, ginned	-	-	-	bales	20,466
Ditto, raw, unginned	-	-	-	packages	7,067
Country cloths	-	-	-	No.	142,557
Country pots	-	-	-	„	19,140
Ducks, alive	-	-	-	„	1,980
Egusi (or bitter gourd) seed	-	-	-	packages	3,597
Fowls, alive	-	-	-	No.	88,412
Goats	-	-	-	„	1,981
Ground nuts	-	-	-	tons	44
Guinea fowls, alive	-	-	-	No.	7,066
Horses	-	-	-	„	50
Indigo (leaves)	-	-	-	packages	3,725
Ivory	-	-	-	teeth	628
Kolah nuts	-	-	-	packages	7,484
Love birds	-	-	-	No.	345
Mats	-	-	-	packages	67,957
Palm kernels	-	-	-	tons	20,783
Palm oil	-	-	-	gallons, O.M.	800,520
Pigeons, alive	-	-	-	No.	15,385
Pigs	-	-	-	„	1,910
Potash	-	-	-	packages	10,672
Shea butter	-	-	-	„	2,709
Sheep	-	-	-	No.	2,328
Soap (native manufactured)	-	-	-	packages	8,968
Turkeys	-	-	-	„	32

Accra is next to Lagos the most important place of trade within the colony. Accra.

It is situate in an open champaign country about 60 feet above the level of the sea. A few hours travelling in the interior brings one to Akropong, 1,600 feet above the level of the sea, the sanitarium of the coast where the Basle Mission has its head quarters. Situation and description.

The Castle of Christiansborg, about four miles east from the town of Accra, has been adapted for the residence of the Governor and the public offices, and between it and Accra stand a handsome Court House, and several detached cottage residences for the officers, all near the sea, and free from malarious influences.

There is a good hard carriage road between Accra (commencing from the Basle Mission Factory) and Christiansborg, a great part of which is planted with tamarind trees which when in blossom impart a pleasing effect. Horses thrive at Accra, and one meets with specimens from America, the Gambia, Sallagha, and Lagos.

There is some good shooting three or four miles inland, where there is a shooting club and box; antelopes and partridges with a few wild ducks are the chief game.

The sanitary condition of the town of Accra commands unremitting attention, and in course of time will be cleared of its acres of cactus, on which the cochineal insect feeds, in the rear of the settlement whence emanate the most direful exhalations caused by the filthy habits of the lower classes of the people, who are said to be naturally wild and intractable.

There is a good lighthouse at Accra. The landing is dangerous, but it is in contemplation to extend by artificial means a reef or ledge of rocks that runs out from the shore to form a break-water. The castles or forts formerly erected by the English and Dutch were destroyed by an earthquake.

The only public building of note is the Wesleyan Chapel, contiguous to which is a large block of building comprising the missionary and school rooms on the ground floor of the society. These premises in point of height and magnificent proportions of the rooms have been pronounced to be the finest Mission House along the whole coast of Africa. The immediate neighbourhood, however, is dirty and filthy, and there is a stagnant pond close to it.

Bad sanitary status.

Accra, notwithstanding the recent efforts to improve it, is still perhaps the most objectionable place on the coast in respect of its sanitary status. It is made constantly busy by the traffic of numerous parties of women bearing large calabashes of palm oil on their heads for sale, coming chiefly from the countries to the eastward.

Cape Coast Castle.

Situation and description.

Cape Coast Castle is at present the seat of Government, and here the principal merchants in this part of the coast have their head establishments. It is an exceedingly quiet and well ordered place, owing in great measure to the good influence exercised by the Wesleyan Missionary Society over the mass of the people, and extending it in 50 different places near to and around Cape Coast where they have established chapels and schools.

There are no public buildings except the Castle, Christ Church, the large Wesleyan Chapel and Government House, the others being hired. The houses are chiefly built of swish (mud and broken granite), and many are very superior and capacious, whilst the native places of residence may be termed merely mud huts, generally of a quadrangular form. On Connor's Hill, overlooking the sea, there is an Imperial Sanitarium, and on Prospect Hill is the beautiful retreat, situate in its own extensive grounds, of the late Mr. Barnes, a merchant of Cape Coast.

Government House although lying rather low has an imposing aspect. Its grounds were tastefully laid out by the late Acting Governor Simpson. Almost the only recreation is the afternoon stroll along the Salt Pond Road. Horses will not live, and what few carriages are occasionally seen are drawn by men. Travelling is done by hammock, slung upon a pole with flat cross pieces supported on the heads of four men. The Houssa band plays every evening from 8½ to 9.

The landing at Cape Coast when the boats are managed by skilful hands is not usually dangerous or difficult except in the rainy season, when the wind and sea set inshore. The road to Elmina, until one reaches the Sweet river, lies through the bush not far from the beach. It is a good level sandy road thus far, lined with beautiful creepers and varied flowers. Underneath the rush thrives the plant whose leaves somewhat resemble those of the aloe, which furnishes the fibre for the manufacture of fishing nets for taking the shoals of herrings that visit this part of the coast and which when smoked find their way far into the interior as an article of food. The road on the west of the Sweet river to Elmina is hard and rocky, the bush ceases and the country has an open and pleasing appearance.

Elmina.

Situation and description.

Elmina consists chiefly of one long street in which there are a few good houses. The river Benyan, which is crossed by a wooden bridge, conducts one to the Castle, to the west of which lies the ruins of the native town that was bombarded during the Ashantee War. Landing at Elmina is at all times practicable, and there is a sufficient depth of water to admit from the sea to the river Benyan small craft. This place offers great advantages for the construction of a dock for the repairs of ships, there being no accommodation of that nature along the whole line of coast. When under Dutch rule it was said

to contain 12,000 to 20,000 inhabitants. Here are the Government Agricultural Gardens.

Secondee town has 2,500 inhabitants, and is built in a rocky amphitheatre. The landing is good. At Dixcove the landing is usually good. At Cape Three Points a lighthouse has been erected by and is kept up by the Colonial Government. It stands at an elevation of 70 feet above the level of the sea. Axim is well watered, being supplied with streams rising from the hills, very fertile, and is said to be the most healthy place on the coast, as the town is one of the cleanest. Population, 750. The landing is good, and ship's boats can enter it at all times.

The population of the Gold Coast, including the Protectorate, is estimated at 400,000. The abolition of slavery within the Protectorate caused great inconvenience to the many persons holding domestic slaves, who elected to leave their masters and mistresses, and return to their own family connexions or countries to which they respectively belonged; but that is as nothing compared with the great boon conferred upon those who were in a state of serfdom. The value of freedom is now being practically understood.

Owing to the difficulty of obtaining hired domestic labour and the great demand for it, many unprincipled itinerant traders to Ashantee barter their goods for slave children, and clandestinely introduce them into the Protectorate, where they find ready purchasers. Several cases of slave dealing and pawning have come before the courts, and the delinquents punished with fine or imprisonment with hard labour.

#### LAGOS, 1875.

Lagos.

REVENUE, 43,367*l.*,

EXPENDITURE 34,380*l.*,

Revenue and expenditure.

Of which 38,812*l.* 7*s.* 5*d.* was derived from customs duties.

The surplus being devoted to paying off a moiety of the loan.

Duty on spirits, 6*d.* per imperial gallon proof.

Duty on tobacco, 2*d.* per lb.

IMPORTS, 459,736*l.*

EXPORTS, 517,555*l.*

Imports and exports.

	£
From the United Kingdom	330,822
From France	24,493
From Germany	59,727
From the Brazils	24,628
From Zanzibar and Mozambique	10,439

	£
To the United Kingdom	270,975
To France	42,447
To Germany	135,927
To the Brazils	13,720

#### The CHIEF IMPORTS and EXPORTS were—

	Value	£		Value	£
Cotton Goods	243,110		Bennie Seed, 40 tons	486	
Spirits	32,971		Cotton, 5,127 bales	19,842	
Tobacco	30,734		Ivory, 10,265 lbs.	3,159	
Beads	4,693		Hides	146	
Cowries	12,827		Palm Oil, 1,802,946 gallons	148,919	
			Palm Kernels, 26,456 tons	286,112	

#### CAPE COAST, 1875.

Cape Coast.

REVENUE, 67,368*l.*,

EXPENDITURE, 71,644*l.*

Revenue and Expenditure.

Of which 59,524*l.* was derived from custom duties.

Including 10,663*l.* for public works, contra Parliamentary Grant.

Duty on spirits, 3*s.* per imperial gallon proof spirit.

Duty on tobacco, 6*d.* per lb.

Imports and exports.			£			£
	IMPORTS		- 364,672	EXPORTS		- 327,012
	Of which were—			Of which were—		
	Beads	- Value	10,596	Monkey Skins,		
	Specie	- "	17,266	16,253	- Value	1,204
	Cotton Goods	- "	153,204	Parrots, 2,135	- "	450
	Hardware	- "	13,324	Gold Dust, 11,801 ozs.	- "	42,484
	Palm Oil, Casks	- "	11,486	Gold Ornaments	- "	1,564
	Spirits	- "	54,781	Palm Oil, 2,686,528		
	Tobacco	- "	13,234	gallons O M	- "	222,594
				Palm Kernels,		
				6,004 tons	- "	47,252

## Recapitulation.

## RECAPITULATION.

REVENUE.			£	EXPENDITURE.			£
Lagos	-	-	43,367	Lagos	-	-	34,380
Cape Coast	-	-	67,368	Cape Coast	-	-	61,281
Total	-	-	<u>£110,735</u>	Total	-	-	<u>£95,661</u>
IMPORTS.				EXPORTS.			
Lagos	-	-	459,737	Lagos	-	-	517,535
Cape Coast	-	-	364,672	Cape Coast	-	-	327,012
Total	-	-	<u>£824,409</u>	Total	-	-	<u>£844,547</u>

## Chief imports and exports.

## CHIEF IMPORTS AND EXPORTS.

Cottons.			£	Palm Oil.			£
Lagos	-	-	243,110	Lagos	-	Galls. O.M. 1,802,946	148,919
Cape Coast	-	-	153,204	Cape Coast	-	2,686,528	222,594
			<u>396,314</u>	Total	-	<u>4,489,474</u>	<u>371,513</u>
Spirits.				Palm Kernels.			
Lagos	-	-	52,971	Lagos	-	Tons. 26,456	286,112
Cape Coast	-	-	54,781	Cape Coast	-	6,004	47,252
			<u>107,752</u>	Total		<u>2,460</u>	<u>333,364</u>
Tobacco.				Gold Dust.			
Lagos	-	-	30,734			Ozs.	
Cape Coast	-	-	13,234	Cape Coast	-	11,801	42,484
			<u>43,968</u>				

*Note.*—The export of palm kernels from the line of coast hitherto known as the Gold Coast is on the increase, and having regard to the fact that the exports of palm oil is nearly one half more than from Lagos, the trade in palm kernels in future years is likely to become a very considerable one. Final remarks.

With regard to the part taken by the Colony in the International Exhibition held at Philadelphia, of Lagos it may be said simply nil. It would almost be impossible to conceive that so much apathy could have existed. The only contribution being made by Bishop Crowther of a few trifles from the Niger. The same spirit of indifference generally prevailed at Cape Coast, and it was with considerable difficulty that any collection worthy of the name was made, nearly the whole of it having been purchased by the Colonial Government.

Some of the workmanship of the gold ornaments was of the most elaborate nature, notably the Queen's bracelets, adorned with representations of the shamrock, thistle, and rose, their foliage, &c., by Mr. Peter Brown, the principal goldsmith of Cape Coast, who well merits the palm for such an unequalled production.

Indeed it was questioned whether it were possible that native goldsmiths were capable of making such splendid specimens of their handicraft, but the doubt was speedily cleared up Mr. Hazeley, a native gentleman who was present at the Exhibition from Sierra Leone, and who convinced all doubters that the workmanship of all the gold ornaments sent to the Exhibition from the Gold Coast was purely native art.

There were some specimens of palm and other oils, a few nuts and seeds, &c.; a collection of native forest woods, a specimen of panelling in Odoom wood, a writing and envelope case, and a block of polished granite by native workmen in the Colonial Engineer Department. There was a variety of country cloths from the Eastern Districts, Ashantee, and the Niger, and specimens of carved stools cut from blocks of the wood of *Bombax ceiba*. There was also an interesting specimen of coffee produced in eight months after planting.

W. MELTON,

Cape Coast,  
20th December, 1876.

Manager at Cape Coast of the Collection for  
the Philadelphia Exhibition, 1876.



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J A M A I C A .

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**RESIDENT COMMISSIONER FROM JAMAICA,**  
**TO THE**  
**PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**ROBERT THOMSON, Esq.**

# JAMAICA.

REPORT on the JAMAICA COLLECTION of PRODUCTS at the INTERNATIONAL EXHIBITION at PHILADELPHIA, 1876. By ROBERT THOMSON, Esq., Superintendent, Government Botanic Gardens.

JAMAICA is the largest and most important of the British West Indies. It is situated to the east of the Caribbean Sea, and to the south of the eastern extremity of the large island of Cuba, the distance between the nearest points of the two islands being about 100 miles. The island is within N. lat. 17° 40' and 18° 30', and W. long. 76° 10' and 78° 30'. It comprises an area of 3,250 square miles. From the time of the discovery of the island by Columbus, in 1494, it remained in the possession of the Spaniards for 161 years, when it was capitulated to England on the 3rd of May 1655.

Position.

Discovery.

Jamaica was designated "Isle of Springs" by the Spanish discoverers from the abundance of rivers or streams, upwards of 100 of which run into the sea; most of these, however, must be regarded as mountain streams.

First name by discoverers.

The island is traversed in all directions with lofty mountains, of which the Blue Mountain range forms the main ridge. The average elevation of this range throughout, about 50 miles to the eastward of the island, is about 5,000 feet. On approaching the higher altitudes the mountains gradually ascend to and culminate in the Blue Mountain Peak at a height of 7,350 feet. The elevation of the higher hills to the westward of the island, which embraces by far the larger area of the colony, averages from 2,000 to 3,000 feet. Extensive plains or savannahs extend along the southern boundary of the island.

Mountain ranges and heights.

A great variety of climates is found at the different elevations. At the sea level the mean annual temperature is 80° Fahr., the ordinary minimum being 70°, and the maximum 90°. At a height of 2,500 feet above the sea the summer temperature ranges from 70° to 80°, and that of the winter about 8° less. At 5,000 feet, the highest inhabited spot, the maximum temperature recorded is 72°, and the lowest 45°. During winter, however, it rarely falls below 54° or rises above 66°, while in summer it is 6° higher, the average daily variation being only about 5°. In consequence of the wholesale clearance of the original forest in certain localities over hills and plains, especially in the neighbourhood of Kingston, the natural humidity in the said localities has been greatly diminished. Hence, during about 10 months in the year the climate is remarkably dry, to such an extent, indeed, that agricultural pursuits have been in a great measure abandoned. The climate in this locality at a height of a few thousand feet is unsurpassed for salubrity in the world, and at similar heights throughout the island the climate is equally healthy, although in most parts the rainfall is considerably heavier. On the plains, as a rule, the climate is very healthy for a tropical region, except in the vicinity of swamps or lagoons.

Variety of climates at the different elevations from sea level to 5,000 feet.

Clearance of forests.

General salubrity.

The mountainous character of the island affords scope for the successful cultivation of most of the vegetable productions of the temperate and tropical zones.

Suitable for both tropical and temperate growths on mountain ranges.

The medical faculty of the United States has strongly recommended Jamaica as a winter resort for those threatened with pulmonary complaints. In this respect it is stated that the island is eminently adapted to become the Madeira of the United States. It is estimated that about 100,000 patients, and others seeking a milder climate than is afforded in the Northern States, escape to the milder climate of Florida every winter. Unfortunately, most parts of Florida are subject more or less to the influence of malaria from extensive swamps, and it is conceded that as a health-giving resort it possesses

As a sanatorium.

many disadvantages. Large numbers of Americans would visit Jamaica instead of Florida, but the great drawback is the want of hotel accommodation.

Capital.

Kingston is the largest and most important town in the island, and contains 34,000 inhabitants. For a tropical city it is very healthy; this is no doubt due to the arid character of the climate in which it is situated, consequent upon the clearance of the forest before alluded to.

Population of island.

The population of the island in 1871 amounted to 506,154, of which 13,101 were white, 100,346 coloured, and 392,707 black.

Revenue and expenditure.

#### REVENUE AND EXPENDITURE.

	£	£
1864 - - -	281,600	301,335
1865 - - -	295,398	341,296
1866 - - -	327,369	395,597
1867 - - -	393,441	333,125
1868 - - -	368,101	358,795
1869 - - -	441,439	387,724
1870 - - -	440,553	410,497
1871 - - -	460,024	426,910
1872 - - -	494,563	477,807
1873 - - -	514,766	523,458
1874 - - -	541,798	537,261

#### IMPORTS AND EXPORTS.

	£	£
1864 - - -	1,142,919	946,906
1865 - - -	1,050,984	912,004
1866 - - -	1,030,976	1,152,898
1867 - - -	859,168	1,045,093
1868 - - -	1,024,565	1,138,804
1869 - - -	1,224,413	1,162,768
1870 - - -	1,300,212	1,283,026
1871 - - -	1,331,185	1,196,531
1872 - - -	1,559,601	1,418,443
1873 - - -	1,733,121	1,226,011
1874 - - -	1,762,817	1,442,080

Place allotted to Colony at Philadelphia.

The prominent position assigned to Jamaica on the grand central avenue of the Main Exhibition Building secured for the colony the most public exposition of its products.

Receding from the centre of the building along the main avenue, after England, India, and Canada, came Jamaica. Farther on were situated New Zealand and the Australian Colonies. To the rear of Jamaica along a secondary aisle were placed the remaining Colonies of Great Britain which were represented.

Arrangement of exhibits.

On the upper part of the divisional wall (35 feet long by 15 feet high) between Jamaica and New Zealand our Fibres were arranged. Under the Fibres two projecting shelves contained the collection of Woods, and under these to the ground, were closely placed in an upright position about 400 Walking Sticks of some forty species of woods. The only break in this arrangement on the wall was the case of Messrs. Soutar & Co., containing 21 boxes of cigars, which occupied the actual centre of the said wall. On the ground on each side of this case were placed two small tables on which were exhibited within four glass domes the unique Flowers, &c. made of the Lace-bark and the cuticle of the Dagger-plant—the handiwork of Mrs. Nash. On the centre of the department was erected a trophy on which were exhibited to a height of nine feet upwards of 50 samples of Rums, together with samples of Jamaica Liqueurs. On a separate trophy of similar design were displayed the Coffees, Fixed and Essential Oils, Preserved Fruits, &c. In four large flat show-cases placed at the four corners of the department, with passages on all sides, were classified, according to the respective groups to which they belonged, the

various remaining products exhibited. It should be mentioned that, besides the main avenue bounding the frontage, and the wall separating the New Zealand department, two secondary aisles defined the Jamaica section. On the aisle parallel with the main avenue, near the junction with the New Zealand department, was placed the set of Harness sent by Messrs. Brass & Son, and contiguous to this their saddle—these were the only articles exhibited by Jamaica properly excluded from the category of "Raw Products."

The arrangement of the collection, as described, had a very pleasing effect, notwithstanding that it is difficult to render effective an exhibit composed of raw vegetable products. And as a whole the display attracted much attention, as exemplified by the numerous visitors to the department, and the enquiries made by them; as well as by the many complimentary references made by the American and European press.

The last International Exhibition to which Jamaica sent a general collection of products was that of 1862. At the Vienna Exhibition of 1873 cigars were the only produce exhibited by the colony. It may be stated that a complete series of the ores and minerals of the island were shown at the London Exhibition of 1862; at Philadelphia they were wanting. These would have added considerably to the interest and effect of the present exhibit.

The collection at the Philadelphia Exhibition consisted, with a few exceptions, of raw vegetable products, and it was the largest and most valuable display of Jamaica produce which has hitherto been contributed to an International Exhibition; and Jamaica took the first place among British Colonies (not including Canada) in point of the variety and value of Raw Vegetable Products. The collection also took a high position among all countries exhibiting only raw vegetable products; and it was the largest general collection from any West India island.

The position occupied by Jamaica in regard to its large collection of products demonstrated the remarkable fact that this collection was of higher intrinsic value than that represented by any other country which exhibited only raw products. Hence, in consideration of the variety of resources and natural wealth thus exemplified, it is to be deplored that an island so highly favoured and with so large a population, over half a million—equal in point of numbers to all the other British West Indies put together—should at a great International Exhibition be utterly incapable of illustrating some advancement in manufactured products.

Among articles exhibited from Jamaica for the first time the following may be enumerated:—Cinchona barks (three species), jalap, senna, &c., paper stock and "half stuffs," various essential and fixed oils, concentrated lime and Seville orange juice, tea, fruit, both fresh and preserved, including candied rose apples, exhibited for the first time from any country, and awarded a special medal, logwood extract, pimento leaf extract, catechu, sappan and candle wood dyes, collection of economic plants, dried nutmegs, vanilla, and tobacco of high quality.

The samples of rum, ginger, pimento or allspice were unequalled from any country, as also the collections of tropical fruits and tropical economic plants. The exhibits embraced under the following heads were unequalled in point of value by any other British colony, and, as regards the Colonies, a few of them were contributed exclusively by Jamaica:—Tobacco, cigars, medicinal substances, including cinchona barks, bamboo paper stock and "half stuff," dyewoods, fixed oils, essential oils, fibres, woods (as regards their economic value and size of specimens), and walking sticks. Among the woods are included a lancewood spar and cashaw and lignum vitæ railway sleepers.

It is gratifying to note that increased attention is being devoted to the development of new and important products, samples of most of which were exhibited at Philadelphia for the first time from the island. These new features of the productive resources of the island are no doubt destined to play an important part in its progressive development, especially when it is remembered that the almost exclusive cultivation of the sugar-cane in Jamaica, as well as in the other West India colonies, has greatly impeded the progress of minor industries.

Having been entrusted by the Government to prepare a general collection of the products of Jamaica for the exhibition, I made application to gentlemen in different parts of the island to obtain for exhibition samples of sugars,

Previous displays.

Collection mainly consisted of raw vegetable products.

High intrinsic value of display.

Details.

New and important products.

Collection of exhibits.

rum, coffee, tobacco, and a few other individual articles, with which to render the collection as complete as possible. The applications thus made were cordially responded to, and the articles thus obtained, together with the various other products comprising the bulk of the exhibits, which I had specially collected, embraced the whole collection as exhibited by the Government. Particulars as to the products shown will be found in the subjoined catalogue. Comparatively few articles were exhibited by private parties.

Comparisons with displays from other tropical countries.

In drawing up this report on the part taken by Jamaica at the International Exhibition, I have instituted a comparison of our products with similar products represented at the exhibition by other tropical countries—those with which useful comparisons could be made. Although great care has been taken to render this report useful to the community, it should be remarked that no attempt has been made to epitomise the exhibits of the countries referred to, other than with the view of elucidating the merits or defects of our products.

Increasing prosperity of colony.

The different subjects referred to in this report fairly indicate the increasing prosperity of the colony. Unlike its former condition of prosperity, it is now being formed on the more permanent basis of mixed industrial pursuits, in which there is a growing disposition to embark.

Expansion of trade with New York.

A noteworthy feature of the increasing commerce of Jamaica consists in the expansion of trade with New York. Much interest in the collection has been manifested by merchants as well as by the general public, numerous inquiries relative to Jamaica products having been made with the view of extending commercial relations. With the great natural advantages the colony possesses there is nothing to prevent it again becoming one of the most prosperous of British colonies.

Brief descriptions of most of the exhibits are given in the catalogue, which forms an Appendix to this report, and the information given in the Report has especial reference to the agricultural and commercial progress of the colony as represented by its principal exhibits.

The Jamaica Government contributed the great bulk of the collection, which was prepared for and on behalf of the Government by the writer, who was also officially delegated to represent the colony at Philadelphia.

Presentation to New York Park Central Museum.

The whole collection of Government exhibits, except the plants, has been presented to the New York Central Park Museum—a spacious building recently erected. In view of our direct commercial relations with that city, this presentation of our collection is most opportune.

In reference to the collections of sugar, rum, coffee, tobacco, and a few other individual exhibits, it should be explained that those shown by the Government were obtained on application being made to the growers and others.

Thanks to British Commissioners.

The island is indebted to Her Majesty's Executive Commissioners, Colonel H. B. Sandford, R.A., and Professor T. Archer, F.R.S.E., for the valuable aid rendered by them at the exhibition.

#### SUGAR.

Sugar, its history in the island.

During the palmy days of slavery in the British West India Islands Jamaica acquired the proud title of the "Brightest Jewel in the British Crown." The prosperity which Jamaica then enjoyed arose from the fact that the colony took the foremost position in the introduction of the extensive cultivation of the sugar-cane. Hence, during slavery the island became the principal sugar mart of the world. The remarkable prosperity attending the extensive culture of the sugar-cane in Jamaica stimulated the spread of the plant throughout the West Indies until sugar was established as the great and almost exclusive staple commodity throughout these islands, and maintained with extraordinary fluctuations to the present time. Thus, prior to the abolition of slavery in 1833, these islands produced nearly all the sugar found in commerce. The abolition of slavery dealt a severe blow to this great industry, as well as to the minor ones, and nowhere so keenly as in Jamaica, where numerous plantations were abandoned, many of which have never since been restored. The export of sugar fell from about 140,000 tons to the present average of 30,000 tons, and this notwithstanding the prodigious expansion of the sugar trade.

Decadence of export.

It is only during recent years that the island is emerging from the conditions of long-continued depression to which it had fallen. As regards sugar

production there is less actual improvement to report than appertains to other products; and in respect of improved cultivation and manufacture of sugar the colony is doubtlessly behind several of the other British West India Islands.

The total number of acres under cane cultivation is 48,000, and the average quantity of sugar exported, as before indicated, is 30,000 tons. The great bulk of the sugar consumed in the island, probably 6,000 tons, is grown and manufactured by the peasantry, an immense number of whom cultivate small plots of canes. It is estimated that they own upwards of 5,000 mills for the manufacture of sugar. It will thus be seen that the yield of sugar is considerably less than a ton per acre. This contrasts unfavourably with the yield on most of the other West India islands. It should, however, be explained that the principle of "ratooning" or cropping from perennial stools is more generally carried on in Jamaica than elsewhere, a fact which results in diminished returns.

Number of acres under cultivation.

A stimulus is likely to be imparted shortly to the sugar industry of the island in consequence of the utilisation of upwards of 40,000 acres of arid land by means of irrigation. The waters of the Rio Cobre river, one of the largest in the island, are undergoing embankment and distribution at a cost of about 100,000*l.* for the purpose of converting this hitherto arid waste into what it is likely to become, the garden of the island. It is calculated that most of the land in question will be supplied with water equivalent to a rainfall of 60 inches a year.

Stimulus to trade by irrigation of land.

With this command of water and with good cultivation the average yield of sugar can be raised to three tons per acre. In cane sugar producing countries it has, therefore, been reserved for Jamaica to initiate means for the systematic irrigation of the plant. The rapid strides beet sugar is making render every advancement that tends to enhance the preëminent sugar-cane a matter of the highest importance. It is greatly to be hoped that "usines" or central factories will be constructed as a natural consequence of this important scheme. Apart from the sugar-cane, this great undertaking will exert a powerful influence on other agricultural pursuits.

Increase of average yield.

During the past few years many new varieties of sugar-canes have been introduced and cultivated in the Botanical Garden with the view of selecting improved varieties with which to replace the old stock of plants. Several of the new varieties are already very promising. To Mauritius is due the credit of directing attention to the utility of cultivating new varieties of cane, and it is gratifying to find that success has already attended the efforts made in this direction.

New varieties of sugar cane.

The ten samples of Sugar exhibited fairly indicated the qualities ordinarily produced on the best estates. One sample consisted of Vacuum-pan Sugar obtained from Albion estate, the only plantation in the island on which Sugar is made by this process. Compared with the two great sugar-producing colonies—Mauritius and British Guiana—the character of the Jamaica Sugars evidenced the antiquated system of sugar manufacture still in operation. The enterprising colony of Mauritius surpassed all the other countries at the exhibition, in the variety and excellence of Sugars. British Guiana had also a magnificent display of Sugar, and two excellent samples were represented from the central factory in Trinidad. The other British Colonies which exhibited Sugar were Queensland and New South Wales.

Comparison of samples with other colonies.

In contrasting the less favourable position occupied by Jamaica in its exhibit of Sugars with the other great Sugar colonies, especially in reference to the improved classes of Sugars resulting from improved processes of manufacture, it should be remembered that this island, from its former preëminent position as a Sugar colony, has undergone a complete transition from well-known causes. Hence the prosperous Sugar colonies referred to are in a great measure in the full enjoyment of newly acquired energy. Fortunately, however, for Jamaica, it is less dependent upon Sugar as an exclusive industry than most other Sugar plantation colonies.

Reasons for transition in export.

In a colony once the greatest of all Sugar producing countries, and which has maintained this article as its chief staple, under the most adverse circumstances, it is important to note that Beetroot, whose uninterrupted success has hitherto seriously prejudiced the cultivation of the more important Sugar Cane,

Decline of beet-root.

has, according to recent announcement, arrived at the climax of its capacity as a Sugar-yielding plant.

Superiority of  
the sugar cane.

The verification of this fact must necessarily exert a powerful influence in stimulating the increased production of the sugar cane, which, in natural saccharine richness, far surpasses any other plant. Independently of the rivalry of the beet-root sugar, as far as Jamaica is concerned, there are abundant prospects and scope for improvement of this great staple West India commodity. Irrigation, and improved modes of cultivation, as well as improved processes of manufacturing the sugar, are unquestionably destined to double the value of our present acreage returns.

### RUM.

Jamaica rum.

The Rums of Jamaica are the best and most famous in the world, and they command at least twice the price of any other. The quantity of this article annually exported averages nineteen thousand puncheons, valued at nearly 300,000*l*. Nearly all this goes to England and Germany. To the United States only a comparatively small quantity is exported. This is to be regretted, as the high reputation of "Jamaica Rum" is universally recognized in the United States; indeed the name of the island is intimately associated with that of this famous product.

The various samples exhibited represented most of the celebrated brands of the island.

Exports to  
United States.

The total quantity of Rum exported from Jamaica to the United States in 1875 was only 65 puncheons, valued at less than 1,000*l*. This is considerably less than is exported even to the British West Indies, nearly all of which are rum-producing colonies. Moreover, the quantity sent to the United States is inconceivable when compared with the total value of the quantity exported from Jamaica to all countries in 1875, viz. 320,774*l*. Hitherto England has imported nearly all the rum shipped from the island, but during recent years Germany is becoming a direct importer on a considerable scale.

Hope of in-  
creased export.

In consideration of the established popularity of Jamaica rum throughout the United States, there is ground for believing that an immense demand will ere long spring up in that progressive country for the genuine article. The American rate of duty on rum is 2 dollars per gallon proof, and the usual price for the so-called Jamaica rum is from 1½ to 2 dollars per bottle.

British Guiana  
and Queensland.

The only other British colonies which exhibited rum are British Guiana and Queensland. Respecting the latter colony, it may not be amiss here to refer to a misleading assertion touching the prestige of our rum, evinced in the following extract from the British Official Catalogue of Products at the Philadelphia Exhibition. This statement is from the section of the catalogue devoted to the Queensland exhibits, on the subject of sugar growing:—"The rum of 1867 is now prized above any Jamaica for its rich mellowness, for in these inexperienced days they did not in Queensland stint the sugar in making it, as is now done in the more sophisticated West Indies." This statement, it is almost needless to say, is contrary to the expressed opinion of the Judges, and to the unassailable reputation of the article.

Awards.

The list of medals awarded for our rums, according to the Schedule of Prizes received, is somewhat disappointing. Six medals are thus awarded for upwards of 40 samples that were exhibited by the producers. Rums exhibited by persons other than the producers were not considered by the Judges eligible for examination. Although, in the determination of these awards, several of our most famous brands were overlooked, I would most respectfully bear testimony to the diligent conclusions of the Judges.

The number of samples exhibited was fifty-eight, and as this collection was displayed in a central trophy in the Exhibition it attracted great attention.

### COFFEE.

Coffee, acres  
under cultivation  
and levels of  
plantations.

After sugar and rum, Coffee is the next staple product of importance in the colony. There are upwards of 22,000 acres under cultivation. It is grown at all heights between the sea-level and 5,000 feet. The quality at the lower altitudes is inferior, but at a height from 3,500 to 5,000 feet the produce is the finest in the world. The prices realized last year in England for this quality of coffee ranged from 7*l*. to 7*l*. 1*s*. 6*d*. per cwt.

The abolition of slavery affected coffee cultivation in a manner similar to that of the sugar-cane. With slave labour the export amounted to about 20,000,000 lbs. annually. Now it only averages about 8,000,000 lbs. Previous and present production.

With slave labour this cultivation was exclusively carried on in large plantations, only a small proportion of which are now kept up, and the peasantry now own the largest acreage, made up of small plots of cultivation.

It is gratifying to observe that during the past few years this cultivation is again being rapidly extended, this time, however, almost exclusively by the peasantry, 5,000 acres having been planted within the past four years. Unfortunately the coffee produced by the peasantry is of very inferior quality, as compared with that produced on plantations. This is due to the indifferent manner in which coffee is prepared for the market. With a few cheap appliances and greater care on the part of the small settlers in the manipulation of this important product the value of the article would be enhanced about 50 per cent. Extension of late years.

The extensive destruction of the primeval forest on the higher mountains of Jamaica, chiefly for the cultivation of coffee, has had the effect of diminishing materially the natural humidity of the localities thus cleared, and the result is that the comparatively dry climate that has been created at a height of from 2,000 to 4,000 feet above the sea-level is peculiarly fitted for this product. By far the largest number of plantations now under cultivation in the island are situated on the said cleared land; there is therefore good reason to believe that the changed conditions of humidity to which this locality has been subjected have influenced in a great measure the keeping up of these plantations, inasmuch as nearly all other plantations throughout the island have been abandoned. The samples of coffee exhibited represented the produce grown at the lower, medium, and higher elevations. Hopes for further extension.

Two new varieties of coffee, namely, Liberian and Cape Coast, have been recently imported from Kew Gardens. Both kinds are being propagated at the Botanical Gardens, and several enterprising coffee planters have made application for several thousand plants. The first named variety is said to produce a fine quality of coffee, and also to be very prolific and hardy. New varieties.

The Jamaica samples of Coffee were unequalled in point of quality by any other coffee exhibited. They consisted of the splendid qualities produced on our high mountain plantations, together with several intermediate and common samples grown at lower elevations, down to the level of the sea. The various qualities thus represented the altitudinal influences affecting this product. The other coffee-growing British Dependencies which exhibited this article were India and Ceylon. The former showed some 20 small samples obtained from the India Museum, and probably many years old, consequently inferior looking specimens. Amongst those from Ceylon were several of excellent quality. Quality unsurpassed of Jamaica exhibits.

The two countries which supply the United States with nearly all the coffee imported thereto, namely, Brazil and Java, displayed numerous samples. 59 samples were shown by Java and Sumatra; a few of the specimens were of good quality, but the great majority of them were inferior. To Brazil, the greatest of all coffee-producing countries, is due the credit of having made the noblest coffee exhibit at Philadelphia. The numerous samples were very effectively arranged on a large trophy, on and around which were arranged in profusion piles of this the most important product of that great country. There are about 1,000,000 acres under coffee in Brazil, and the value of this article annually exported amounts to 10,000,000*l*. On instituting a minute comparison between the coffees of Jamaica and those from other parts of the world, as represented at the Exhibition, the following distinctive features of superiority in favour of the Jamaica article were exemplified. The striking blue colour, the perfect form, and unity of appearance of the berries, and the almost complete absence of the "silver skin." Brazil, Java, and Sumatra.

It is noticeable that our exports of coffee to the United States are not only very extensive, but they are increasing at a greater ratio than are the exports to England. This is a very encouraging feature of our expanding commercial relations. It should, however, be stated that very little, if any, of our famous quality of coffee ever reaches America. The difference between the value of the ordinary quality and the finer quality of Jamaica coffee is remarkable, the prices realised for the first ranging only from 3*l*. to 4*l*. per cwt., whereas for the Acres under coffee in Brazil.

latter the highest prices in the English market are obtained, namely, from 6*l.* to 7*l.* 11*s.* 6*d.* per cwt.

The Schedule of Prizes to hand announces that eight medals are awarded for Jamaica coffees.

#### COCOA.

Destruction of plantations by epidemic.

Upwards of a century ago this plant was largely cultivated in the island, but it was suddenly destroyed by an epidemic respecting which no particulars have been recorded. The area now under cultivation is only about one hundred acres. In the British West India Islands the most important articles of production next to sugar are coffee and cocoa, both of which, in the number of acres under cultivation and in the gross value of export, are nearly the same. Jamaica and Trinidad respectively produce nearly the whole of these articles, and both islands have thus a corresponding number of acres under cultivation. Cocoa flourishes in the hottest and most humid districts, whereas a comparatively dry atmosphere in an elevated region is best adapted for coffee. Less labour is employed in the cultivation of cocoa than is required for coffee. Hence it is a more remunerative crop. As an article of British production cocoa is confined to Trinidad, except a small quantity grown in several of the other West India Islands.

Advantages of climate for cultivation.

The necessary conditions of soil and climate for cocoa cultivation in Jamaica exist in a high degree in most parts of the island, and coffee is now extensively cultivated in some localities that are far better adapted for cocoa. The steadily expanding demand for this important article of commerce, coupled with the possession of a soil and climate eminently adapted for its culture, are strong inducements to private enterprise.

Strong reasons for extension of plantations.

A medal was awarded for Chocolate manufactured in Kingston. It should be explained that the samples exhibited were purchased for and exhibited by the Government. I have from time to time in the strongest possible manner recommended this important plant for cultivation in extensive districts of the island. The plant is likewise peculiarly adapted to the limited labour market of the island, inasmuch as crops are abundantly produced with considerably less labour than is required for coffee cultivation. With the view of encouraging the cultivation of this plant, premiums might be offered by the Government for every few hundred trees arriving at a given age. The advantages accruing from this would no doubt in the course of a few years be realised from the enlarged export returns.

#### TEA.

Introduction and growth.

The samples of the Assam variety of Tea were grown at the Government Cinchona Plantations. Some 600 plants were introduced from Calcutta through the Royal Gardens of Kew in 1868. Since the establishment of this small plantation at a height of 4,500 feet above the sea, the plants have become quite naturalised, and could now be propagated to any extent. This plant grows with the utmost vigour in our humid mountains—in localities far too damp for profitable coffee cultivation. The Judges at the Exhibition considered the tea of good quality, and accordingly awarded a medal for same in conjunction with coffee-leaf tea. It has, therefore, been clearly demonstrated that tea of excellent quality can be produced on our mountains.

In India, a skilled manipulator prepares on an average seven pounds of tea a day. The average produce per acre ranges from 100 to 250 lbs., and the total cost of production is put down at one shilling per pound. There can be no doubt that the tea producible in Jamaica would be of superior quality to that imported, and which is sold for about five shillings per pound. The value of the tea imported in 1875 was 2,868*l.*

Value.

#### COFFEE LEAF TEA.

Substitute for tea.

This article has been frequently recommended as a substitute for genuine tea, to which it possesses analogous properties. This probably was the only sample of Coffee Leaf Tea at the Exhibition.

As before mentioned, a medal was awarded for this in conjunction with tea.

## DYEWOODS, &amp;c.

*Logwood.*

Notwithstanding that this plant was only introduced into the island about a century and a half ago, it has become so completely naturalized that it occupies a much larger area than any other plant in the colony. Roughly estimated, there are some 200 square miles of land occupied by this tree, nearly all of which is within easy access of the sea. Introduction and spread.

Previous to 1854 only a few thousand tons of logwood were exported annually. Since that period the export has rapidly increased, and during the past few years it has been immensely developed, chiefly on account of the unsettled condition of the neighbouring island of Hayti, whence the quantities exported are considerably diminished. The average annual export now is from 60,000 to 110,000 tons, valued at from 140,000*l.* to 250,000*l.* The quality of this dyewood varies somewhat with the conditions of the humidity of the climate in which it is produced. Increase of export.

It is a remarkable fact, in consequence of the enormous development of the logwood trade during the past few years, that Jamaica now occupies the foremost rank in commerce amongst all logwood producing countries. Fortunately for the future increasing supply of this commercial wood, the general thinning out from time to time creates room for the expansion of innumerable smaller stems. There need, therefore, be no fear of exhaustion, such as has hitherto been commonly entertained. Enormous development of trade.

*Fustic.*

This dyewood is gradually spreading spontaneously over the island. The average export is about 3,000 tons, worth about 8,000*l.* Other dyes.

The other dyes represented by Jamaica were candle wood, sappan wood, annatto, &c.

## SPICES.

*Pimento.*—As is well known, Jamaica exclusively furnishes the world with this article of commerce. One-fifth of the total quantity produced is sent to the United States, thus the quantity exported to that country in 1875 was 10,894 cwts. The prices realised for this article have considerably increased recently, and there is probably some ground for predicting a generally improved market, consequent upon the expanding requirements of commerce. The average export is about 50,000 cwts., valued at about 36,000*l.* Contemporaneously with the clearing of woodland for the establishment of pasture in certain parts of the island a natural growth of pimento springs up. Since the Russian war this spice has been greatly lowered in price, and consequently it is not a lucrative crop. As no cultivation, however, is bestowed upon it other than what appertains to the keeping up of pasture lands, it is a source of profit, especially when heavy crops are obtained. The average annual quantity exported has remained stationary for a long series of years. There are 55,000 acres, more or less, thickly covered with this beautiful tree. Pimento, exclusive monopoly of the spice.

*Ginger.*—This is another famous spice of Jamaica, the prices fetched for which far exceeds that realised for ginger grown in any other country. In the United States, this article is in great repute, both as a spice and as a medicine. Moreover "Jamaica Ginger" is a household word, and, whether fortunately or otherwise, nearly all the ginger sold in the shops is denominated "Jamaica ginger," notwithstanding the fact that only a trifling quantity is exported to that country—thus the export in 1875 was 745 cwts. It should be noted that not only does this island produce ginger of the finest known quality, in the production of which peculiar care is bestowed upon its cultivation and manipulation, but it also produces ginger of the most ordinary quality, to the production of which no particular attention is devoted. The value of the superior article averages over 10*l.* per cwt., and that of the ordinary quality from 3*l.* to 4*l.* This latter is the standard price for nearly all the ginger sold in commerce, excepting the celebrated Jamaica product. Comparatively little of our superior ginger is shipped to America. In view, however, of our rapidly expanding commercial relations with that great country, as a necessary con- Average export.

Number of acres under cultivation.

Ginger. Superiority of Jamaica specimens.

Value of various qualities.

sequence, the development of this trade will eventually ensue. A very large trade might also be carried on in the export of "preserved ginger."

**Acres under cultivation.** The area under cultivation is only a few hundred acres. The quantity exported fluctuates between 5,000 and 18,000 cwts. Like pimento, the annual yield of this product has maintained a pretty even average for a long period.

**Fluctuation of exports.** The best ginger is cultivated at a height of about 2,000 feet above the sea, in a very humid climate. It is cultivated for the most part by white immigrants, who devote great attention to the cultivation, and to the cleansing, from that scraping, and drying processes.

**Cultivation.**

**Nutmegs.** *Nutmegs.*—The Nutmegs exhibited by Jamaica were not equal in point of value to the remarkably large and fine specimens shown by several other countries. The value of nutmegs depends upon size—the larger the size, the greater the value. Our sample of Vanilla was a totally different species from that exhibited by Mexico, and other Vanilla growing countries.

**Vanilla.**

**Other spices.** The collection of spices consisting of nutmegs, cloves, peppers, &c. from Java and Sumatra was one of the choicest contributed by any country.

#### GUINEA GRASS.

**Accidental introduction.** The accidental introduction of a batch of seeds of this precious grass (*Paspalum maximum*) by an African slaver about the year 1750 has powerfully influenced the welfare of the island. The magnificent and well-kept pastoral farms constitute an important industry in various parts of the island. The horses reared upon this grass are the most celebrated in the West Indies, and the horned cattle are remarkably fine for a tropical climate. The area of Guinea grass under actual cultivation amounts to upwards of 110,000 acres, besides, probably, a greater area under spontaneous growth. To this invaluable grass must be ascribed the great success attendant on stock raising, in which respect Jamaica claims an immense advantage as compared with the other British West India Islands, as is evinced by the fact that the more important of the said islands import cattle, mules, &c. to a large extent, whereas Jamaica with its far larger population supplies its own wants. Accordingly, stock is obtainable at far lower prices, and of better quality, in Jamaica than in any of the other islands. There are in the island nearly 80,000 horses, mules, and asses, 120,000 head of cattle, and 20,000 sheep. It is a remarkable fact that guinea grass and pimento thrive best under precisely the same conditions of soil, &c. that prevail in certain parts, namely, the limestone formation, whose porous structure enables the rainfall to escape by means of sink-holes that lead to subterranean streams; hence the immediate and efficient surface drainage. It should also be observed that the richest natural pastures possessed in the island exist in the same localities.

**Marvellous results in stock raising.**

**Census of cattle, horses, and sheep.**

**The results of feeding.**

#### CINCHONA BARKS.

**First cultivation.** Three samples of Cinchona Barks were exhibited, viz., *C. calisaya*, *C. succirubra*, and *C. officinalis*, each seven years old, and weighing respectively three, four, and two pounds, the said quantities having been procured from one tree of each species. The cultivation of cinchonas was commenced by the Government in 1868, and the plantation now consists of 300 acres, about 40 acres having been planted annually. The trees are planted from eight to ten feet apart, and the total number planted out is about 120,000, and it is expected that 50,000 will have been planted during the present year. The average height of the several species of trees planted the first year ranges from 12 to 30 feet. This important plant is now naturalised on the higher mountains, inasmuch as self-sown seedlings are springing up plentifully throughout the plantations. The climatic conditions requisite for its culture are found on the Blue Mountains at a height of from 4,000 to 6,000 feet, with a mean average temperature of from 60° to 70° Fahr., and where it rarely falls below 50° or rises above 70°. The first crop of bark is expected to be realised about the tenth year from the time of planting out, as has been the case in the plantations of India. In 1872 samples of these barks were analysed by Dr. De Vrij of the Hague, and by the Messrs. Howard of London. Very satisfactory results were obtained from *C. calisaya* and *C. succirubra*, but from *C. officinalis* the result was unfavourable. For the extension of the plantations,

**Suitability of climate for culture.**

**Favourable analysis.**

therefore, attention has been exclusively directed to the two first-named precious species. A stem, measuring 22 feet high, of *C. succirubra*, from which the sample of bark was taken, was also exhibited.

The three specimens of Cinchona barks exhibited by Jamaica were the best samples represented by any British Dependency. The Indian Museum exhibited two species of bark, but in very small samples. Mauritius was the only other British possession which exhibited this important product, one sample, the product of a small tree, having been shown. Mauritius, however, does not grow Cinchonas on a commercial scale, so that India and Jamaica were the only important exhibitors from the British Dominions.

Best specimens shown by Jamaica.

The best samples of Cinchona barks, the produce of the country exhibiting, were those from Java. Six species were displayed. Java also was distinguished by the magnificent display of Cinchona alkaloids, consisting of quinine, quinidine, cinchonine, cinchonidine, and several mixed alkaloids, which were the only alkaloids exhibited by the country growing this plant. The general appearance of the barks, as compared with the Jamaica barks, presented little or no difference. Some of those from Java were perhaps somewhat thicker, owing to their greater age, the cultivation having commenced in that country upwards of 20 years ago. Short sections of Cinchona stems of the several species from 7 to 17 years old, afforded practical information as to their conditions of growth. The Cinchona stem, seven years old, shown by Jamaica divested of the bark (which was also shown) measured 22 feet. The Jamaica sample of stem was equal in the diameter of the wood to those from Java 10 years old; and the specimens of stems from Java, each 17 years old, were very slightly larger than the Jamaica specimen.

Javaese samples.

A very interesting and instructive feature of the Java display, in connexion with Cinchonas, was the fine display of photographic views of Cinchona plantations, individual trees, &c., as well as the dried specimens of the different species artistically arranged in an ornamental case.

Photographs of Java plantations.

Several samples of Cinchona bark of fair quality produced by cultivation were exhibited by Mexico, also sections of the stems of the trees.

It is a matter of some surprise that Peru, the native habitat of the most important of all medicinal substances, Cinchona barks, did not exhibit its most celebrated vegetable product. The only exhibit of Cinchona bark as a forest product was made by Venezuela, the samples, however, were of unimportant kinds.

Absence of Peruvian specimens.

The crowning exhibit of Cinchona barks and alkaloids was that made by the firm of Powers and Weightman, the great chemical manufacturers of Philadelphia.

Display by Powers & Weightman of Philadelphia.

#### JALAP.

On the cinchona plantation, at a height of 5,000 feet, a few acres of jalap have been planted, and a crop from the same will be reaped this year. Specimens of jalap tubers grown here were analysed a few years ago by the Society of Apothecaries of England with very favourable results, the percentage of resin in the Jamaica sample being 10·71, whereas in the best commercial jalap imported into England the per-centage of resin amounted only to 10·31.

Favourable analysis.

The whole collection of Medicinal Substances shown by Jamaica, including the Cinchona barks, numbered 23 articles, all of which are of reputed value. The collection, as before indicated, was the most valuable from any British Colony. Our samples of jalap, bitter wood, gum guaiacum, simaruba, cassia pods, pomegranate bark, baobab fruit, and kola nut, were objects of especial interest, either for the excellence of the specimens or for their rarity.

Other Pharmaceutical exhibits.

#### TOBACCO AND CIGARS.

In consequence of the insurrection in Cuba numerous refugees have during recent years settled in Jamaica, and great advantage is accruing to the island from the superior knowledge of the Cubans in the cultivation and manufacture of tobacco and cigars.

Increase of cultivation and progress of tobacco industry.

Tobacco of inferior quality has been cultivated in small patches in various parts of the island since its early settlement.

To the Cubans is due the credit of having been instrumental in the initiation of the cultivation and manufacture of tobacco on a planter's scale, according to their own system. Several plantations, each to the extent of from 50 to 100 acres, have been established in different parts of the island. As before mentioned, tobacco was the only produce from Jamaica displayed at the Vienna Exhibition. The samples in question attracted special attention, and were awarded the Medal of Merit.

Natural  
facilities.

Land abounds in most parts of the island suitable for the production of the finest qualities of tobacco, which is fast becoming an industrial occupation.

In addition to the supply of tobacco seeds grown by owners of plantations for their own cultural wants, upwards of 20 lbs. of the renowned "Vuelta Abajo" seeds from the district in Cuba bearing this name, were obtained, at the request of the Government about two years ago, from Her Britannic Majesty's Consul-General at Havana.

Area under  
cultivation from  
1870 to 1875.

The area under cultivation has steadily increased, as shown by the number of acres in each of the following years :—

1870	-	-	-	-	46 acres.
1871	-	-	-	-	74 "
1872	-	-	-	-	101 "
1873	-	-	-	-	218 "
1874	-	-	-	-	267 "
1875	-	-	-	-	360 "

Best British  
exhibit shown  
by Jamaica.

By far the best exhibit of tobacco and cigars contributed by any British Dependency at Philadelphia was that sent by Jamaica. The eighteen samples of tobacco sent by the enterprising planters, Messrs. Thompson and Weightman, elicited the admiration of all competent parties. On careful examination, the International Judges pronounced the samples of tobacco equal to the finest Havana, an encomium of the highest merit. The cigars shown by Messrs. Soutar & Co. also received the approbation of the Judges, as is evidenced by their decision. It will be remembered that the exhibit of cigars made by this firm at the Vienna Exhibition attracted unusual attention, and obtained a first-class medal.

High reputation  
suddenly ac-  
quired.

The proud position thus assigned to Jamaica in respect to tobacco and cigars, is highly gratifying. A new industry of the utmost importance has not only suddenly sprung into existence, but the articles have in like manner acquired a high reputation. The variety of tobacco grown is from seed obtained from the celebrated Vuelta Abajo in Cuba, the most famous tobacco district in the world. With careful selection of sites and judicious management in the cultivation, over which the Cuban refugees have direct control, and with the acquisition of the skilled Cuban cigar manufacturers, who have adopted Jamaica as their home, tobacco is rapidly becoming a staple article of production. A noteworthy feature of this promising cultivation thus consists in the high quality of the article produced. With a continuation of the same care and attention that is now bestowed upon this product, there is nothing to prevent its becoming one of our great staple articles of export. The misfortunes existing in the neighbouring island of Cuba have been instrumental in establishing this important industry in Jamaica. Under these most favourable auspices, the island is profiting by the practical experience of the most accomplished of all tobacco planters.

Display by  
Jamaica.

The cigars and tobacco shown by Cuba at the Exhibition formed a brilliant display. The cigars were of all grades and sizes, and in great profusion, as were also numerous brands of cigarettes tastefully decorated, in order to impart an attractive appearance. Elaborate cases in variety contributed to the array of this, the most celebrated product of Cuba. Of tobaccos also the gradation of sizes exemplified was considerable; and the finer qualities were placed in bundles, somewhat more evenly than were the Jamaica bundles. Cigars and tobacco of good quality were exhibited by Porto Rico, as also a fine case of cigars from the Government Factories in the Philippine Islands. Brazil and Mexico also exhibited a great variety of tobaccos, cigars, and cigarettes.

Cuba.

Porto Rico and  
Manilla.

Brazil and  
Mexico.

## FIBRES.

At the London and Paris Exhibitions the great variety and excellence of the collection of fibres sent by Jamaica attracted much attention. The collection at this Philadelphia Exhibition comprised a selection of some 30 specimens, together with 10 of basts. The fibres are adapted for the manufacture of ropes, cordage, and textile fabrics from the coarsest description to the finest. Notwithstanding that this subject has been frequently ventilated in Jamaica, and that splendid results await the capitalist in the development of a trade in this direction, no effort has been made to utilise any of the waste substances that are abundantly obtainable. The introduction and application of machinery for the extraction of the fibre is all that is necessary to ensure success. The first fibre enumerated in the Catalogue is the celebrated China grass, or Rhea ("Ramie") in the United States. This grows with the utmost luxuriance in humid parts of the island. At the Botanical Garden a plot of it was experimented upon a few years ago, and it yielded five crops in the year, producing prepared fibre at the rate of over one ton per acre. This fibre would meet extensive and ready sale if offered at about 70l. per ton. The great desideratum in order to ensure the extensive cultivation of this plant is a machine for the production of the fibre. With this object in view the Government of India a few years ago offered a prize of 5,000l. for an efficient machine, but without success. The Agricultural Department of the United States has also directed particular attention to the importance of the cultivation of this plant, which thrives admirably in the warmer States. It is noteworthy that the first plants introduced into the United States were raised in the Washington Botanic Garden from a batch of seeds imported from the Jamaica Botanic Garden some twenty years previously. The Basts exhibited from Jamaica are valuable substitutes for the lime basts of Russia, so extensively used for making mats, &c. In Russia one million trees are cut down annually for this purpose, and from six to ten years growth is required to produce good Lime basts, whereas some of the Jamaica bast-yielding trees grow with such rapidity that they attain to a height of 20 feet in a single season. For example, one plant of the "trumpet tree" (*Cecropia peltata*) would yield annually 1 lb. of bast, and 1,000 could be planted to the acre, thus yielding 1,000 lbs. with hardly any cultivation beyond the first planting. Notwithstanding the great variety and value of the fibres that abound in the island, private enterprise lacks the energy required for their production. A profitable lesson might be taken from the colony of New Zealand, where the fibre obtained from an indigenous fibrous plant (*Phormium tenax*), exported in 1865 only to the extent of 70l., had in a few years increased the value of the export to 132,578l.

India and Mauritius contributed collections consisting of fibres analogous to those exhibited by Jamaica. Amongst the other British possessions, Victoria and Queensland had fair collections of fibres, and New Zealand proudly displayed its famous flax (*Phormium tenax*) in numerous samples, both raw and made into cordage. Trinidad had also some fine samples of fibres, but they were not exhibited to advantage. Brazil, Mexico, &c., had fine exhibits of fibres. The Philippine Islands presented a speciality in the way of piles of Manilla hemp, an article in great request in the United States.

It is very gratifying to announce that the International Judges have, in addition to awarding a medal for the general collection, awarded a special medal for Sisal hemp. This is a plant that is propagated with the utmost facility; it requires a minimum of cultivation, grows alike luxuriantly in the driest and wettest localities in the island, provided the soil be gravelly. The first crop is yielded in four or five years from the time of planting, and a succession of crops every third year is afterwards obtained. One ton of fibre is a fair estimate of the yield for each acre, and it is worth 40l. per ton. A sample of this fibre grown in the Botanical Garden here, was sent to London a few years ago, and valued by a broker at several pounds per ton higher than the Sisal hemp imported from Mexico. A machine has been invented for the extraction of the fibre with economy. This fibre is now largely exported from Central America to the United States, where there is an unlimited market for the article.

Variety and  
excellence of  
fibres exhibited.

Rhea.

Introduction  
into United  
States.  
"Basts."

Indian and  
Mauritius  
fibres.  
New Zealand  
Flax.

Brazilian and  
Mexican ex-  
hibits.

Sisal hemp.

Valua.

## PAPER STOCK AND HALF STUFF.

## Paper stocks.

Bamboo, its  
supplanting of  
"Esparto"  
grass.Use in China  
and Japan.Process of  
manufacture.

A high authority on paper-making materials, Mr. Thomas Routledge, of London, has recently directed attention, in a pamphlet on the subject, to the desirability of utilizing bamboo in lieu of "Esparto." Now that the supply of the latter, which has been imported into England to the extent of 140,000 tons a year, valued at considerably over one million pounds, is becoming exhausted, it is very encouraging to find bamboo recommended as the best material for future supply. Bamboo contains upwards of 70 per cent. of fibre, and no other plant is capable of yielding so large a return of fibre per acre. Several crops are obtainable annually, the aggregate yield of fibre from which would probably exceed 50 tons per annum. Most of the other plants recommended as substitutes for esparto yield only from one to a few tons per acre annually. Thousands of acres of land in Jamaica are overrun with luxuriant bamboo. In large quantities the raw material could be cut, crushed, baled, and delivered at a shipping port for about 17. per ton. It is, however, greatly to be desired that the raw material should be converted into paper stock or half stuff prior to shipment. Samples of the last-named preparations made from young and old bamboo, as well as from other substances, are exhibited. It should be stated that a company has been recently formed in Jamaica for the manufacture of paper stock from bamboo, and a firm of New York paper manufacturers obtained regular supplies of crushed bamboo from Jamaica several years ago. In China and Japan paper-making from bamboo is a well-known industry from time immemorial. The following interesting account of the process of manufacture in China is extracted from the excellent Catalogue of the Chinese Section in the International Exhibition. It may here be mentioned that the Chinese manufacture from the bamboo a great variety of paper, from the commonest qualities to the finest, for writing purposes, the prices for which range from two dollars to twenty-one dollars per pecul:—

"Paper is made chiefly from bamboo, but also from rice straw, cotton, hemp, the bark of the *Ailanthus broussonetia*, the stalks of reeds, and the refuse of silk cocoons. The method of preparation from bamboo is as follows:—The bamboo is stripped of its leaves and split into lengths of three or four feet, which are packed in bundles and placed in large water-tanks. Each layer of bamboo is covered with a layer of lime, water is poured on till the top-most layer is covered. After remaining in this condition three or four months the bamboo becomes quite rotten, when it is pounded into pulp in a mortar, cleansed, and mixed with clean water. This liquid is poured in quantities sufficient for the size and thickness of the sheets required upon square sieve-like moulds. These sheets (of which a skilful workman can make six in a minute) are allowed to dry, then taken from the mould and placed against a moderately heated wall, and finally exposed in the sun to dry. The best quality of paper is made from the shoots of the bamboo, with alum added to the infusion; the second, from the bamboo itself, though a higher grade of this quality is attained by the previous removal of the green portion; and the third from grass or bark leaves of the trees above enumerated."

## WOODS.

Woods—large  
display.

The specimens of woods exhibited were selected for their economic value, and consisted of upwards of 50 species, embracing the most useful woods of the island. They were of large size, accordingly their texture, colour, and other qualities were well developed. In this respect they contrasted very favourably with the collections of woods from all other countries. Indeed, although nearly all countries exhibited their characteristic woods, as a rule, only small specimens from young trees were furnished. Our collection was therefore unusually attractive and instructive, and illustrated the great variety of purposes to which our woods are applicable, in which respect our resources at command were well exemplified.

The only other collection of woods comparable to ours in regard to the size and aspect of the specimens exhibited by a British Colony (Canada excepted) was that from New South Wales. In this instance, the Jamaica samples yielded in point of size. As regards the economic value of the timbers, however, the palm must be yielded to Jamaica. The New South Wales specimens

consisted chiefly of Eucalypti, some of the species of which are the largest trees in the world. To indicate the value of the Jamaica woods, allusion need only be made to the following:—mahogany, teak (*Tectona grandis*), cogwood, bullet tree, cashaw, *lignum vitæ*, ebony (*Brya ebenus*), mahoe, yacca, &c. &c. The beautiful collection of New South Wales woods was first exhibited at the London Exhibition of 1862, and afterwards presented to the Kew Museum, whence they were sent to Philadelphia.

Value and specimens.

New South Wales collection.

The richest collection of woods contributed by any country to the Philadelphia Exhibition was that from Brazil. These were not uniformly choice specimens, but they embraced innumerable kinds, many of which were in huge logs.

Amongst the woods exhibited by Jamaica was a fine specimen of lancewood spar, of which Jamaica exports large numbers. This, probably, was the only specimen at the Exhibition. Hence an important error appeared in the "*Scientific American*," dated the 28th of October last. This error occurs in an article on "Materials for making carriage wheels," at the Centennial Exhibition. In the subdivision of the article in question, entitled "Shafts, whippetrees, and side bars," it is stated: "For shafts, hickory is commonly used by American carriage builders, and answers the purpose admirably. Lancewood, however, from the West Indies, would, without doubt, be preferable, but it is difficult to obtain, and very expensive. It is much to be regretted that not a specimen of lancewood in the rough is exhibited at the Centennial; and although it is used in connexion with several of the carriages exhibited, it is so disguised by paint or varnish as to give, to those unacquainted with it, little or no idea of what the timber really is." The same article continues, "That for wooden side bars, now so popular in connexion with light road waggon . . . lancewood would doubtless prove the best for this purpose, and come into general use, were it not for its expense, and the difficulty of obtaining it in sufficient quantities; for it possesses those qualities particularly demanded for side bars, namely, stiffness, toughness, and elasticity."

"Scientific American," error in description.

#### TANNING MATERIALS.

This collection was interesting as indicating our resources. The most interesting article was the sample of tanning concrete made from pimento leaves, for which a patent has been recently obtained. Two samples of leather tanned from this were exhibited. Divi-divi and mangrove, both valuable tanning materials, were exhibited. Divi-divi might be cultivated for export on our waste arid lands with great advantage. At present, we import this article to a small extent for tanning.

Tanning specimens.

#### WALKING STICKS.

The specimens of neatly finished "walking sticks," numbering about four hundred in forty varieties of woods, had a very good effect, arranged at the foot of the woods and fibres. Pimento is the most useful of the above, as it is in extensive demand, both for walking sticks and umbrella handles. The manner in which these sticks were prepared reflects credit on the principal exhibitor, William Reid, an industrious black man of Kingston, although a medal has not been awarded for this collection.

Varieties.

#### FRUIT AND FOOD PRODUCTS.

In the Agricultural Hall were displayed a collection of fresh fruits, and an assortment of the staple food products grown in the island. This was the first exhibit of the kind ever sent to an Exhibition out of the island. Among the fruits were several species which probably were shown for the first time in the United States from any country. The specimens were not selected for any special merit, but merely represented the ordinary type commonly produced; the samples of the three varieties of pine-apples, however, were somewhat small, although of excellent quality. The expansion of the fruit trade with New York is a most encouraging feature of the steadily increasing commercial relations between the island and the United States. The establishment during the past few years of regular steam communication

Fruits.

Expansion trade.

Advantages,  
geographical,  
for orange trade.

between Kingston and New York has stimulated the trade in question. The value of the fruit exported in 1870 was 901*l*. In 1874 it increased to upwards of 10,000*l*. The export value in 1875 cannot be precisely stated, but it shows a large increase. The principal fruits exported are oranges and bananas, the former fruit (Jamaica orange) rapidly acquiring a high reputation in the New York market, where they fetch a higher price than is paid for any other imported orange. Hitherto nearly all the oranges imported for the supply of the United States have been obtained from the Mediterranean and Cuba. Florida has recently been making strenuous efforts to produce oranges to compete with the imported fruit, and they are now largely sold in the market. The advantages Jamaica possesses over the Mediterranean, owing to its geographical position, are obvious; and the West India trade, of which Cuba has hitherto been the chief mart, is being gradually transferred to Jamaica. The total number of oranges imported into New York from Kingston in 1875 was, according to the "New York Times," 8,335,270, or 695,041 more than from Havana during the same year. The total number of oranges imported from the West Indies in the same year was 22,550,375. The newspaper above cited remarks:—"The importations of oranges per steamers from Kingston, Jamaica, show the growing importance of the trade with that island. The imports in 1873 consisted of 7,747 barrels, "in 1874, 14,762 barrels, and in 1875, 21,642 barrels." The value in New York is at least 1*l*. per barrel, thus, 21,642*l*. From the Mediterranean there were imported into the United States in 1875 upwards of 340 millions of oranges, of which over 100 millions, or about one-third, had perished on the voyage.

Faults in  
packing.

This number of Jamaica oranges in America would be worth one million pounds sterling. Notwithstanding the highly successful establishment of our oranges in the United States, the New York fruit dealers complain sadly of the careless and unsatisfactory manner in which nearly all the oranges are packed. Thus, as a rule, the barrels of oranges on arrival in New York, if placed in an upright position, are void to a depth of about six inches. But for the short voyage, this want of proper packing would have a disastrous effect upon the fruit; as it is, they are considerably deteriorated in value, inasmuch as their preservation is rendered precarious. Of course it will be easily perceived that loosely packed oranges in barrels are unsafe. Bearing on this question, there is another point to which it is of great importance that attention should be paid; I allude to the careful handling of the oranges from the time they are picked from the trees until they are packed. The reckless manner in which this is at present performed would render their lengthened preservation impracticable.

Excellence of  
oranges.

It is a matter of notoriety that a smaller per-centage of the oranges imported into the United States from the Mediterranean is lost on the voyage than oranges from Jamaica.

The excellence of our oranges, coupled with our favoured geographical position, secure for the island advantages that cannot be over-estimated, and as regards the extended production of oranges in Florida, Jamaica need not fear competition, as the latitude in which this fruit is cultivated in Florida skirts the northern limit of its profitable cultivation; hence the difficulties to be encountered in its cultivation.

It will be perceived from the foregoing remarks that the orange trade of Jamaica is probably destined to become a highly important industry. It is also greatly to be hoped that Jamaica will devote attention to the extensive cultivation of lemons, which are imported to the United States to an immense extent from the Mediterranean.

Bananas—value.

*Bananas.*—The number of bunches of bananas imported into New York from Jamaica in 1875 was 37,950. The value of these in New York is at least eight shillings per bunch, or 15,180*l*. for the whole. The total number of bananas imported into New York in 1875 from the West Indies and Central America was 657,880 bunches, of which an average of 20 per cent. perished on the voyage.

From reliable sources I was informed in New York that a larger per-centage of the bunches of bananas imported from Jamaica perished than the bananas from elsewhere. This was attributed partly to the system of packing in the

ships, and partly to the insufficient ventilation afforded in the ships. Bananas are more perishable than oranges, and consequently require more careful packing. In view of the vast quantity of this fruit which Jamaica is capable of sending to America, no pains should be spared to ensure the greatest attainable success in packing. I have been credibly informed that an immense quantity of bananas has been shipped from Jamaica during the past few months.

Faults in packing.

The great bulk of the bananas imported into New York are a different variety from the one we export—the kind so largely imported is of a reddish colour.

**Pine-apples.**—Among the four varieties of Jamaica pine-apples exhibited was our highly esteemed Ripley. In the Botanical Garden a few acres of this plant have been planted with the view of attracting private enterprise to the cultivation of this valuable fruit for the American market. Several excellent new varieties have been introduced during the past few years, which are being propagated for distribution. The great bulk of the pine-apples imported into New York comes from the Bahamas, but they are not equal in point of quality or size to the better class of the Jamaica fruit. The total number of pine-apples imported into New York in 1875 was 5,258,755, of which 1,625,989 perished on the voyage.

Four varieties. Ripley highly esteemed.

Bahama exports.

A large number are also obtained from Havana, and recently excellent consignments have been received from Porto Rico. The pine-apples obtained from the Bahamas are of inferior quality and very small, the average prices realised being only about sixpence. The Havana fruit fetches a much higher price. Consignments of choice Jamaica Ripleys have realised 2s. to 3s. each. Our exports, however, are insignificant. What the establishment of steam communication between New York and Kingston has done to develop our orange and banana trade it is equally calculated to do in facilitating the export of pine-apples. The only difference is, that contemporaneously with the establishment of the steamers, oranges and bananas were abundantly obtainable without special cultivation. Pine-apples, however, differ from the above, inasmuch as they require for their cultivation considerable labour, skill, and close attention, as well as selected sites. Hence to meet any extensive demand this fruit must be cultivated for the purpose.

Havana and Porto Rico.

Pine-apples of superior quality, and at a moderate price, are a great desideratum in America. There is, therefore, nothing to prevent Jamaica from creating an important trade in growing and exporting choice pine-apples.

Reasons for extending trade.

**Cocoa-nuts.**—The number of cocoa-nuts exported from Jamaica to New York in 1875 was about 300,000. The total number imported into New York from elsewhere was 7,478,470. In consideration of the great value of the products of the cocoa-nut, namely, coir and oil, there is no reason why Jamaica should not export millions to America. The average total number of cocoa-nuts annually exported from Jamaica is two millions. The number of cocoa-nut trees growing in Jamaica has not been computed, but the writer has estimated it at over one million, and the number is constantly being increased. The annual yield of nuts from one million trees would amount to at least fifty millions. These nuts are largely used by the peasantry for making an edible oil for their own wants. Notwithstanding this immense number of cocoa-nuts, it is to be regretted that there is no machinery in operation in the island for the manufacture of oil or coir. The rude and wasteful process of preparation by the negroes is very unsatisfactory. The husk which yields the coir is nowhere turned to account except to a trifling extent for stuffing a few mattresses, the value of which, instead of being allowed to rot on the ground as at present, would be worth from 30,000*l.* to 40,000*l.* a year. In Ceylon these articles are important industries. The annual value of the cocoa-nut oil exported is a quarter of a million pounds, and of coir nearly fifty thousand pounds, and there are over 3,000 mills for the expression of the oil, including several large establishments worked by steam power. Throughout several of the British West Indies a blight seriously affects the cultivation of the cocoa-nut. Even in Jamaica a district some 50 miles in length along the line of the shore is devoid of this useful tree, owing, doubtless, to a blight, the nature of which unfortunately has not been investigated.

Number exported in 1875 to New York.

Total number exported from Island.

Waste in production of oil and coir.

Necessity of  
fast sailing  
steam ships.

As before indicated, the Jamaica fruit trade with the United States is capable of unlimited expansion, and it is found that the allotment of space in the steam vessels employed in the service is quite inadequate for the augmented trade. It has frequently occurred that large numbers of oranges and bananas which are brought to Kingston for shipment are rejected for want of freight room. The favoured geographical position of the island to America is of great advantage to the export of perishable fruit. Steam communication has, therefore, inaugurated a new industry, and its future expansion will be greatly influenced by increased facilities of transport. An important step towards this end would be secured by fast sailing steam ships. The average time now taken between Kingston and New York is from six to seven days. As the distance is only 1,450 miles the voyage should be made within five days.

Good results  
therefrom.

Among the advantages that would result from rapid transit would be the export of fruits of a more perishable character than those referred to. For instance, the mango, which grows in greater abundance than any other fruit in the island, could be supplied to any extent, and there is no doubt that the better varieties would be prized. Three of the best varieties grown in Jamaica were exhibited with the general fruit collection in Agricultural Hall, and a considerable proportion of them kept for about a week. Frequently small consignments of mangoes are received in New York from Havana.

#### YAMS, &c.

Acres under  
cultivation.

Yams and Plantains constitute the staple articles of food throughout the island. There are about 40,000 acres of yams under cultivation, and plantains abound in proximity to the huts of the peasantry. Cocos (*Colocasia esculenta*) and sweet potatoes are also largely grown, and the bread-fruit tree is abundantly established. The cultivation of Yams is an extensive industry amongst the peasantry. The tubers are planted chiefly in the spring, and the crop is reaped in from six to nine months. The area usually planted by each peasant averages about one acre; so that there are probably 40,000 plots of yams scattered over the more humid districts of the island. The yield per acre, perhaps, averages five tons, making the gross yield amount to 200,000 tons a year, worth 5s. per cwt. or one million pounds sterling. To the self-supporting ability of the negroes consequent upon the food produce in question, coupled with other natural advantages, must be attributed in a great measure the somewhat independent position of the negroes as regards continuous labour on the sugar estates.

Yield per acre  
and in the gross.

#### CANDIED FRUITS AND PRESERVES.

Many varieties.

These articles were a source of much interest, as they served to illustrate the character of our tropical preserves. Several of the candied fruits are valuable, for instance, pine-apples, cashew, Seville orange, and lemon; as are also some of the preserves: pine-apple, guava, tamarinds, ginger, and limes. It is interesting to note that the International Judges commended in the highest terms the excellence of candied Rose-apples; accordingly, for this a special medal was awarded. This article was exhibited by Jamaica for the first time from any country, and consequently it is new to commerce. The Rose-apple (*Jambosa vulgaris*) was introduced from the East Indies, but it is so completely naturalised, by self-sown seeds, that it has become one of our commonest trees. Vast quantities of the fruit may be gathered in all parts of the island.

Novelty.

#### ARROWROOT, MEALS, &c.

Arrowroot,  
plantain, and  
cassava meals.

The samples of arrowroot, plantain, and cassava meals, were equal in point of quality to any similar exhibits from other countries. Enquiries were made as to the extent of production and cost of these articles, and there is no doubt that a ready market would be found for them in the United States. Enquiries were also made for considerable quantities of plantain meal, with the view of testing experimentally its reputed efficacy for invalids. Bermuda produces

Bermuda.

the best arrowroot in commerce. Our Jamaica sample compared rather favourably with the samples shown by that island. Brazil, Venezuela, &c., were the other countries which exhibited assortments of meals and starches similar to those sent by Jamaica. In conjunction with the above products were exhibited the various peas or pulses, Indian corn, Guinea corn, rice, &c., which were useful as serving to indicate the resources at command. Perhaps the most complete collection of rices, pulses, &c., from any tropical country was that from India, and exhibited by the India Museum. This collection strikingly illustrated the innumerable varieties of rice, and the influence of climate on its cultivation in the different parts of India. Thus, there were upwards of 150 samples of rice and paddy shown. Other grains and pulses were also shown by India in great variety.

**Corn.**—The most important article of food for island consumption in the above series is corn, which as a staple article of food produced in the island is next in point of value to ground provisions. Corn is a favourite object of cultivation among the peasantry, by whom it is everywhere produced, although only in small plots. It is the only cereal commonly cultivated in the island, but it is cultivated in the rudest possible manner. The total number of acres of this plant cultivated in all parts of the island, according to the latest returns, is 1,351. The yield from this may be safely computed at 20 bushels per acre, which at 5s. per bushel is not quite 7,000*l*. To our great discredit the value of corn and cornmeal imported from the United States, during each of the past few years, has ranged from 24,000*l*. to 34,000*l*. With an important cereal already so generally cultivated and thoroughly understood by the peasantry, and of which two crops a year are obtainable, instead of the single crop in Northern climes, it is greatly to be desired that the island should produce sufficient for its own wants. New and valuable plants are constantly imported into the island by the Botanical Gardens, with the object of enriching and expanding the agricultural resources of the country. With a new and unknown product there are difficulties and disappointments to be overcome. But corn is already an established product, the augmented cultivation of which can be carried on with the utmost facility. Hence the encouragement of its extended cultivation claims especial attention.

General cultivation by peasantry.

The recent construction of the irrigation works on the St. Catherine plain, places at the disposal of private enterprise, the command of water for agricultural purposes, the influence of which, in a tropical climate, it would be difficult to over-rate.

An increased duty upon the imported article, or an actual premium offered for cultivation, would in all probability, have the effect of stimulating cultivators to the production of this valuable grain.

In the extension of this cultivation in Jamaica, it is greatly to be desired that the American system of cultivation be initiated, thus substituting cultural skill for the primitive and unsatisfactory mode of culture pursued here.

#### FIXED AND ESSENTIAL OILS.

As already mentioned, the Fixed and Essential Oils together formed the largest exhibit of the kind from any British colony at the Exhibition. The samples of the oils were prepared specially for display. Out of the collection of fourteen specimens of fixed oils, only two are ordinarily made in the island; and the essential oils, of which there are nine specimens exhibited, are not utilised there.

Largest exhibits from any British colony.

On reference being made to my catalogue of the exhibits, it will be seen that several other materials for making oil could be easily turned to commercial account. Amongst these may be especially mentioned the pindar (*Arachis hypogea*). Of essential oils there are also several that could be turned to good account for perfumery purposes—these form considerable articles of commerce in less favoured countries.

#### LIME JUICE, &c.

Among the minor articles of export that are capable of considerable development may be mentioned Concentrated Lime and Seville Orange Juices.

The value of the Lime Juice exported in 1874 was upwards of 5,000*l*.

Value of exports.

Limes of equal  
value with  
lemons for juice.

**Limes.**—It is somewhat singular that to many Americans our Limes in the Agricultural Hall were a novelty. This is, no doubt, to be ascribed to the fact that Lemons are in general use in the United States, in lieu of Limes. For the purposes to which Lemons are applied, Limes are equally valuable, and as the latter are produced like Oranges, without cultivation, in nearly all varieties of soils and climates in the island, they could be sent to America at a cheap rate. The most important use of Limes, however, is the juice, which is in extensive demand; Concentrated Lime juice is worth in America £30 per puncheon of 100 gallons. 150 barrels of Limes is estimated to make one puncheon of the juice, and Limes are only worth 1s. per barrel in certain parts of the island. Sour Orange concentrated juice, also (the fruits abound in the island), fetches £18 per puncheon. The eminent firm of Powers & Weightman, in Philadelphia, import annually from Sicily from 300 to 500 puncheons of concentrated Lime juice. These gentlemen have made special efforts to encourage the production of Limes in Jamaica on an extensive scale.

Suitability for  
growth.

The worn-out and abandoned Coffee hills in the Port-Royal mountains, in the neighbourhood of Kingston, are eminently adapted for the growth of this plant. The trees begin to bear as early as coffee, and when they are established the only cultivation required would be to keep down the high growing bush. The manufacture of the juice is of the most simple character.

#### ARTIFICIAL FLOWERS, D'OYLEYS, &c.

Art successes.

The remarkably beautiful baskets of flowers, &c. made of the cuticle of the leaf of the dagger plant (*Yucca aloifolia*) and lace bark, exhibited by Mrs. Nash, were objects of especial admiration. The exquisitely beautiful D'Oyleys and fans made from the lace-bark and indigenous filmy ferns, also elicited great admiration. The latter were exhibited by Mrs. Brooks. Magnificent specimens of the lace bark, peculiar to Jamaica, were exhibited by Mr. Robert Nunes. At the Exhibition, all the foregoing articles were unique, and, owing to their delicate texture and novelty, elicited general attention.

#### PLANTS.

Collection of  
plants presented  
to Fairmount  
Park Commis-  
sioners.

The collection, consisting of upwards of 100 species of our most useful plants, were exhibited in the Horticultural Hall, and were by far the most interesting collection of Tropical Economic Plants exhibited. Some of the species were new to the United States. This was the first collection of Jamaica plants that has been contributed to an exhibition out of the island. The collection has been presented to the Fairmount Park Commissioners at Philadelphia, and the plants remain in the same building in which they were exhibited.

#### WAX.

Opportunity for  
extension.

Four exhibitors sent bees wax, two of whom were successful in being awarded Medals for bleached samples. This industry is worthy of encouragement among the class of small settlers who are unable to perform ordinary field labour.

ROBT. THOMSON.

Jamaica, 2nd January, 1877.

LIST of AWARDS to EXHIBITORS in the JAMAICA SECTION: Philadelphia  
International Exhibition, 1876.

*P signifies Award for Exhibit.*

(The Government of Jamaica received an award for Collective Exhibit.)

Exhibitor.	Address.	Specific Object.
<i>P a.</i> Langier, F. & Co. - - -	Kingston -	Chocolate.
<i>P a.</i> Thomson, Robert, Superintendent Government Botanical Gardens.	Gordon Town -	Preserved Fruit.
<i>P a.</i> Thomson, Robert* - - -	Gordon Town -	Essential Oils.
<i>P a.</i> Lascelles, Mrs. C. - - -	Arntully -	Coffee.
<i>P a.</i> Elliott, Ernest - - -	Vere - - -	Coffee.
<i>P a.</i> Chalmer, Francis - - -	Radnor -	Coffee.
<i>P a.</i> Macclaverty, Mrs. - - -	Chester Vale -	Coffee.
<i>P a.</i> Harrison, James - - -	Hordley Estate -	Coffee.
<i>P a.</i> Davidson, John - - -	Kingston -	Coffee.
<i>P a.</i> Stephens, Dr. - - -	Bellevue -	Coffee.
<i>P a.</i> McLean, John - - -	Clifton Mount -	Coffee.
<i>P a.</i> Grant, Charles - - -	Kingston -	Wax.
<i>P a.</i> Soutar & Co. - - -	Kingston -	Leaf Tobacco and Cigars.
<i>P a.</i> Thompson & Weitsman - - -	Potosi - - -	Leaf Tobacco.
<i>P a.</i> Nash, Mrs. F. - - -	Kingston -	Hats and Flower Lace.
<i>P a.</i> Auvray, P. E. - - -	Kingston -	Wax.
<i>P b.</i> Thomson, Robert - - -	Gordon Town -	Hemp, Sisal, &c.
<i>P b.</i> Thomson, Robert - - -	Gordon Town -	Vegetable Fibres.
<i>P b.</i> Jamaica Commission - - -	Jamaica -	Economic Plants.
<i>P b.</i> Jamaica Centennial Commission -	Jamaica -	Fruits.
<i>P b.</i> The Government - - -	Jamaica -	Coffee.
<i>P b.</i> The Government - - -	Jamaica -	Coffee-leaves, Tea.
<i>P b.</i> Thomson, Robert, Superintendent Government Gardens.	Gordon Town -	Woods and other Products.
<i>P b.</i> Thomson, Robert - - -	Gordon Town -	Tropical Fruits.
<i>P b.</i> Georgia Estate - - -	Jamaica -	Rum.
<i>P b.</i> Amity Hall Estate - - -	Jamaica -	Rum.
<i>P b.</i> Blue Castle Estate - - -	Jamaica -	Rum.
<i>P b.</i> New Works Estate - - -	Jamaica -	Rum.
<i>P b.</i> Lasquinet Estate - - -	Jamaica -	Rum.
<i>P b.</i> Hordley Estate - - -	Jamaica -	Rum.
<i>P a.</i> Government Botanic Gardens -	Jamaica -	Raw Sugar.

\* These Oils were prepared by Mr. J. J. Bowrey, the Government Analytical Chemist.

NOTE.—The Awards marked (a) were included in a list given to me, at the request of the British Executive Commissioner, by General F. A. Walker, Chief of the Bureau of Awards, the day before the ceremony of the announcement of the Awards—this request was granted in consequence of my departure from Philadelphia on that day. The additional Awards marked (b) were included in a list forwarded to me unofficially since my return from Philadelphia.

R. T.

A DESCRIPTIVE CATALOGUE of the COLLECTION sent from the ISLAND  
of JAMAICA to the CENTENNIAL EXHIBITION of 1876 at  
PHILADELPHIA. Compiled by ROBERT THOMSON.

*Exhibited by the Government.*

SUGARS.

1. Albion Estate (Vacuum-pan Sugar).—Obtained from W. S. Richards, Esq.
2. Constant Spring Estate.—Obtained from W. S. Richards, Esq.
3. Mona Estate.—Obtained from Louis Verley, Esq.
4. Monymusk Estate.—Obtained from Ernest Elliott, Esq.
5. Bog Estate.—Obtained from Ernest Elliott, Esq.
6. Pusey Hall Estate.—Obtained from Ernest Elliott, Esq.
7. Whitney Estate.—Obtained from Ernest Elliott, Esq.
8. Hillside Estate.—Obtained from James Harvey, Esq.
9. Taylor's Caymanas Estate.—Obtained from Joseph Reid, Esq.

## Rums.

10. Vale Royal Estate.—Obtained from David Galloway, Esq. Brand, VR Crop, 1873.
11. Same Estate.—Crop, 1874.
12. Do. — Do. 1875.
13. Do. — Do. 1876.
14. Frome Estate.—Obtained from William Vickers, Esq. Brand, S c F.—15 years old.
15. Five years old.—From the same.
16. Crop, 1876.—From the same.
17. Kew Estate.—Obtained from William Vickers, Esq. Brand, Q within a diamond.
18. Fontabelle Estate.—Obtained from William Vickers, Esq. Brand, S F with a heart between.
19. Bellialle Estate.—Obtained from William Vickers, Esq. Brand, S e.
20. Bluecastle Estate.—Obtained from William Vickers, Esq. Brand, I W O.
21. Cornwall Estate.—Obtained from William Vickers, Esq. Brand, Lc.
22. Mount Eagle Estate.—Obtained from William Vickers, Esq. Brand, ME.
23. Fort William Estate.—Obtained from William Vickers, Esq. Brand, F<sub>W</sub>.
24. Georgia Estate.—Obtained from William Vickers, Esq. Brand, G P with a diamond between.
25. Appleton Estate.—Obtained from M. C. Morgan, Esq.
26. Hordley Estate.—Obtained from James Harrison, Esq. Brand, H Crop, 1865.  
M L
27. Crop, 1876.—From the same.
28. Amity Hall.—Obtained from James Harrison, Esq. Brand, A Crop, 1876.  
T C
29. Wheelerfield.—Obtained from Jas. Harrison, Esq. Brand, M Crop, 1876.  
W
30. Belvidere Estate.—Obtained from Plato Elphick, Esq. Brand, I C F. Crop, 1875.
31. Hopewell Estate.—Obtained from W. S. Richards, Esq. Crop, 1875.
32. Crop, 1876.—From the same.
33. Bog Estate.—Obtained from Ernest Elliott, Esq. Brand, E N P.
34. Bog Estate.—Obtained from Ernest Elliott, Esq. Brand, M. Crop, 1876.
35. Yarmouth Estate.—Obtained from Ernest Elliott, Esq. Brand, G.
36. Monymusk Estate.—Obtained from Ernest Elliott, Esq. Brand, M with a diamond between.  
R S
37. Pusey Hall.—Obtained from Ernest Elliott, Esq. Brand, P  
H F
38. Mona Estate.—Obtained from Louis Verley, Esq. Brand, M  
L V
39. Holland Estate.—Brand, H. Crop, 1868.
40. Blenheim Estate.—Obtained from C. W. Steer, Esq.
41. Mexico Estate.—Obtained from F. Hall, Esq.
42. Hillside Estate.—Obtained from Jas. Harvey, Esq.
43. Taylor's Caymanas Estate.—Obtained from Joseph Reid, Esq. Crop, 1872.
44. Crop, 1873.
45. Ditto, 1874.
46. Ditto, 1875.
47. Obtained from Messrs. J. Wray and Nephew, Merchants :—  
Rum—1st quality.  
" 2nd "  
" 3rd "  
" 4th "  
" 5th "
48. Obtained from George J. Peynado, Esq., Merchant.—3 samples.
49. Obtained from Messrs. Alberga and Mitchell, Merchants.—Samples.

## COFFEE.

50. Clifton Mount No. 1.—Obtained from John McLean, Esq.
51. Clifton Mount Pea Berry.—Obtained from John McLean, Esq.
52. Radnor.—Obtained from Francis Chalmer, Esq. Brand, R  
A M
53. Radnor Pea Berry.—Obtained from Francis Chalmer, Esq.
54. Sherwood Forest No. 1.—Obtained from John Davidson, Esq. Brand, S F  
W R.

55. Pleasant Hill No. 1.—Obtained from George Henderson, Esq.  
 56. Clydesdale No. 1.—Obtained from Mrs. Maclaverty. Brand, C  
 A M L  
 57. Windsor No. 1.—Obtained from Mrs. Lascelles.  
 58. Belle-Vue No. 1.—Obtained from Dr. Stephens.  
 59. Belle-Vue Peaberry.—Obtained from Dr. Stephens.  
 60. Newfield.—Obtained from James Harrison, Esq.  
 61. Brockenhurst.—Obtained from Ernest Elliott, Esq. Brand, B  
 I M  
 62. Sample of Lowland Coffee as rudely prepared and sold by the peasantry.

#### MEALS, ARROWROOT, &c.

63. Plantain Meal (*Musa Paradisiaca*).—This is prepared by slicing the fruit and drying it in the sun, after which it is ground. It is very palatable and digestible, and suitable for invalids or children. The composition and nutritive value of this meal closely approach to rice. One acre, on an average, would yield upwards of one ton of meal. At present it is only used to a small extent, but it could be produced at a cheap rate. The fruit itself, when cooked, furnishes an important article of food in the island.
64. Banana Meal (*Musa sapientum*).—Similar to the preceding.
65. Breadfruit Meal (*Artocarpus incisa*).—Two fruits of average size give one quart of meal. An acre would yield about one ton. Palatable, but seldom used. The tree is abundant, and the fruit forms a large element of food.
66. Cassava Meal (*Manihot utilisima*).—Cassava cakes made of this meal are commonly sold in Kingston, and are considered a great delicacy. They are very wholesome and nutritious. Highly cultivated land yields twenty tons of the fresh tuberous roots per acre; and this, in one year, would be equal to five tons of meal. Probably this meal could be produced on a large scale at the rate of one penny per pound. The plant grows best in dry localities.
67. Negro Yam Flour (*Dioscorea alata*).—Very good and nutritious flour, but the proportion obtainable is not large. Rarely used. The yam is a large tuberous root, weighing from 50 lbs downwards, and it constitutes the chief food of the negroes, there being nearly 50,000 acres of it under cultivation in the island.
68. Sweet Potato Flour (*Batatas edulis*).—Cultivated for the tuberous roots to a considerable extent in some districts.
69. Arrowroot (*Maranta arundinacea*).
70. Cassava Starch.—Commonly used in the island, and sold at 6d. per quart.
71. Negro Yam Starch.
72. White Yam Starch.—A variety of the preceding.
73. Cocoa Starch (*Colocasia esculenta*).—Cultivated for the tuberous roots, which are, however, inferior to yams. Yields a large proportion of starch.
74. Sweet Potato Starch.
75. Maize (*Zea Mays*).—This well-known cereal is cultivated largely, but not quite to the extent of supplying our own wants.
76. Guinea Corn (*Sorghum vulgare*).—Cultivated to a small extent. Requires less rainfall than maize.
77. Rice (*Oryza Sativa*).—Only a few small patches cultivated, but might be largely cultivated with advantage. This is the irrigation variety.
78. Conga Pea (*Cajanus indicus*).—This perennial pea is commonly cultivated, and is valuable owing to its thriving in dry arid situations.
79. French Bean, "Red Pea," (*Phaseolus vulgaris*).—Our most commonly cultivated legume.  
 Variety of ditto.
80. No-Eye Pea (*Cajanus flavus*).
81. Cucholds Increase (*Dolichos unguiculatus*).
82. Sugar Bean (*Phaseolus saccharatus*).
83. Black Eye Pea (*Dolichos sphaerospermum*).
84. Bonvis Bean (*Lablab vulgaris*).
85. Jerusalem Pea (*Phaseolus species*).

#### FODDER.

86. Guanga Pods (*Calliandra saman*).
87. Candle-tree Pods (*Cassia emarginata*).
88. Bastard Cedar Fruits (*Guazuma tomentosa*).

## OILS.

It may be mentioned that all the essential and almost all the fixed oils contained in the following list have been prepared and analysed at the request of the Superintendent of the Botanical Gardens by J. J. Bowrey, Esq., the Government Analytical Chemist:—

89. Cocoa-nut (*Cocos nucifera*).—Obtained by pressure. This system of preparation is a desideratum in the island.
90. Cocoa-nut.—Obtained by boiling. This process of preparation is general throughout the island. This edible oil is extensively used by the peasantry. It is also used for burning. Producing in this island to a large extent.
91. Cashew-nut (*Anacardium occidentale*).—This oil is sweet tasted, and is said to be superior as an edible oil to the olive or almond. The kernels have been introduced in English commerce under the name of cassia seeds. The roasted nuts are an excellent dessert fruit.
92. Cashew-nut.—Oil from pericarp of the nut is also obtained.
93. Oil of Ben (*Moringa pterygosperma*).—Used by watchmakers and perfumers. It does not turn rancid. Grows in waste places, produces seed in one year, and requires little cultivation. The great perfume manufacturer, Eugene Rimmel, says of this oil, "It produces an extremely fine, clear, sweet, and fluid oil, qualities very valuable in perfumery." The winged seeds yielded 65·6 per cent. of kernels, and these kernels yielded 30 per cent. of oil by expression, or 19·7 of oil from the whole seed.
94. Gingelly or Wanglo (*Sesamum indicum*).—This tasteless oil is quite equal to olive oil, with which it is said to be commonly mixed in France. It keeps for years without becoming rancid. The plant is an annual and grows in dry places. The seeds have medicinal properties assigned them. In India it is used more extensively by the natives than cocoa-nut oil; and both seeds and oil form an article of extensive export. It is also used for perfumery. In Egypt and China it is largely produced. There are only a few acres of the plant in cultivation in Jamaica.—The seeds expressed, as bought in the market without any preliminary cleansing, yielded 40 per cent. of oil.
95. Ground-nut or Pindar (*Arachis hypogæa*).—This is a well-known and valuable commercial oil, which, however, is not made in Jamaica, there being only a few acres in cultivation. "This oil is used as a substitute for that of olives, to which it is equal in quality." It does not soon become rancid. Like the preceding, this plant, which is an annual, might be largely cultivated in Jamaica with great advantage. Ground-nut gave 43·75 per cent. of kernels, and the kernels gave 40 per cent. of oil by expression, or 17·5 per cent. of the whole nut.
  - (1.) The dark sample expressed from the kernels as removed from the shells.
  - (2.) The lighter expressed from the residual cakes of No. 1, after grinding and drying them for two days in the air.
96. Sand-box (*Hura crepitans*).—Twenty drops of this oil used as a purgative is equal to a tablespoonful of castor oil, and less nauseous. Sand-box seeds yielded on expression 25·5 per cent. of oil on the whole seed, the bulk of the shells having been removed before pressure was applied.
97. Antidote Cacao (*Feuillea cordifolia*).—Semi-solid fatty oil. Burns well in lamps and sometimes used medicinally. Antidote cacao yielded 55 per cent. of kernels, which yielded at a temperature of 84° Fahr. 18 per cent. of oil by expression. From the residue 28 per cent. of a solid fat was obtained by means of bi-sulphide of carbon, or a total of 46 per cent. of fatty matter from the kernels, or 25 per cent. on the whole seed.
98. Candleberry-tree or Cobnut (*Aleurites triloba*).—This is known here as country walnut. In Ceylon it is called Kekuna. It is a palatable oil and burns in lamps. Said to be a good substitute for linseed oil. The cobnut yielded 33 per cent. of kernels, giving 57 per cent. of oil by expression, or 19 per cent. on the whole nut.
100. Candleberry Tree.—Obtained by boiling.
101. Castor Oil (*Ricinus communis*).—Obtained by pressure without heat. Could be largely produced with little cultivation.
102. Castor Oil.—Obtained by boiling. This is the kind used generally in the island.

## ESSENTIAL OILS.

103. Pimento Berry Oil (*Eugenia pimenta*).—This oil has been recommended for perfumery purposes. It is used for perfuming soap.
104. Pimento Leaf.—The leaves with twigs yielded rather more than 0.75 per cent. of oil.
105. Lemon Grass (*Andropogon Schœnanthus*).—Used for perfumery, and medicinally.
106. Seville Orange (*Citrus Bigaradia*).—Distilled from the rind. Tree plentiful in Jamaica. 580 oranges weighing 180 lbs. yielded 12 ozs. of oil.
107. Seville Orange Leaves.
108. Lemon (*Citrus Limonum*).—Distilled from the rind. Tree common.
109. Sweet Orange (*Citrus aurantium*).—Distilled from the rind. Tree plentiful.
110. Juniper Wood (*Juniperus barbadensis*).—Distilled from the wood. 5 per cent. of oil.
111. Eucalyptus Globulus.—Distilled from the leaves. 0.75 per cent. of oil.

## SUBSTANCES USED FOR PERFUMERY.

112. Pimento Berries.
113. Pimento Leaves.
114. Eucalyptus globulus Leaves.
115. Juniper Wood.
116. Khus-Khus Rhizome (*Andropogon muricatus*).

## OIL CAKES.

117. Candleberry or Cobnut.—This cake is of great value in Ceylon for feeding stock.
118. Ben or Moringa.
119. Earth Nut.
120. Sandbox.
121. Santa Maria.
122. Cashew.
123. Gingelly.

## SUBSTANCES USED FOR MAKING OIL.

124. Cashew Nut Seeds.
125. Ben and Moringa Seeds.
126. Gingelly ditto.
127. Ground Nut ditto.
128. Sandbox ditto.
129. Antidote Cacaoon ditto.
130. Cob-nuts.
131. Castor Oil.

## TIMBERS AND FANCY WOODS FOR GENERAL PURPOSES.

132. Mahogany (*Swietenia Mahagoni*).—This, the most important of all furniture woods, was formerly largely exported, but from its scarcity, save in inaccessible situations, it is now exported to a comparatively less extent. Used in the island for making furniture, &c. 1,000*l.* has frequently been paid for a log of this wood.
133. Cedar (*Cedrela odorata*).—Large tree; trunk 5 ft. in diameter. One of the most useful and durable woods in the island. Used for housebuilding, for planks, beams, posts, bridges.—Wood light and easily worked. Lasts from 30 to 40 years in the ground. Good logs make beautiful variegated furniture.
134. Naseberry Bullet Tree (*Sapota Sideroxylon*).—Large timber; trunk from 3 to 4 ft. in diameter. Heavy, very strong, tough, and durable. One of the best woods of the island. Used for housebuilding, planks, beams, posts, and for all kinds of millwork, and water-wheels, for all of which purposes it is of the greatest value. Not being affected by damp, it would be invaluable for bridges and piles. Millwork has been found sound after 100 years use.
135. Fiddle Wood (*Citharexylon* Sp.).—Large timber, tough, and durable. Used for millwork and other purposes to which a good wood is applied. Wood beautifully grained, and well adapted for fancy work.
136. Braziletto Wood (*Peltophorum linnæi*).—Small tree, with a trunk from 12 to 14 inches in diameter. Valuable for ornamental cabinet work. Employed in turning, and in making violin bows.

137. Dogwood (*Piscidia erythrina*).—Small tree ; attaining a height of about 30 ft., trunk 18 inches in diameter, very strong and tough, and not affected by damp.
138. Cogwood (*Ceanothus chloroxylon*).—Height about 60 ft., trunk  $2\frac{1}{2}$  ft. in diameter. Extremely hard and durable. Unequalled for cogs of wheels and millwork, for which purpose it is more generally used in Jamaica than any other wood. Cogs, &c. are found quite sound after 100 years use.
139. Cashaw (*Prosopis juliflora*).—Height about 50 ft., diameter of trunk about 2 ft. One of the few gregarious trees of the island. Grows only in dry regions in the vicinity of the sea. The trunk is contorted, and seldom straight throughout. For out-door posts and small piles it is invaluable. It is the most valuable and extensively used firewood in the island.
140. Mahoe (*Paritium elatum*).—Height from 60 to 80 ft., diameter of trunk from 2 to 3 feet. Used for making furniture, for which purpose, next to mahogany, it is more generally employed than any other wood here. Also used for flooring, doors, shingles, and for house-building purposes. The colour of the wood is dark green or blue, and beautifully variegated.
141. Breadnut (*Brosimum alicastrum*).—Lofty tree, diameter of trunk from 3 to 4 ft. Used for cabinet work, flooring, and ceiling houses, and other building purposes. The leaves with twigs and seeds are utilized for fodder of a highly nutritious character for horses and cattle. In seasons of excessive drought, when grass and other fodder substances fail, it is of great importance, and therefore deserves extensive planting throughout the tropics.
142. Mountain Guava (*Psidium monotonum*).—Lofty tree, trunk 3 ft. in diameter, very hard, close grained, and durable: Used for beams, posts, and planks, and in the construction of mills. It would be invaluable for bridges and piles.
143. Jamaica Ebony (*Brya ebenus*).—Small tree, very hard and heavy, and almost indestructible. Used for inlaying and fancy work, rulers, &c. A cross section of a block of wood is also shown. The true ebony of the East is from a different plant. The average export of this wood is about 300 tons per annum. It grows in dry localities in the vicinity of the sea.
144. Lignum Vitæ (*Guaiacum officinale*).—Small tree, hard and heavy. Used for blocks, pulleys, rulers, &c. The fibres of this wood are cross-grained. It is of great value where weight is no objection. It is indestructible. Small piles have been found quite sound after a lapse of 150 years. Grows abundantly in dry savannahs. About 100 tons of this wood are exported annually.
145. Santa Maria (*Calophyllum calaba*).—Lofty tree, remarkably straight, wood soft. Used for staves for puncheons, but imparts a peculiar flavour to rum. Used also for shingles and boards.
146. Oak (*Catalpa longisiliqua*).—Lofty tree, trunk 3 to 4 ft. in diameter. Used for posts, cart building, &c. ; very durable, posts having been known to last 40 years in the ground. This is one of the most valuable timber trees in the island, a fact which is not generally known. It grows rapidly, and thrives in arid situations. It would no doubt be of great value for piles, railway sleepers, and for most constructive purposes.
147. Calabash (*Crescentia cujete*).—Height 30 ft., trunk about  $1\frac{1}{2}$  ft. in diameter. Wood very durable and tough. Used for handles of tools, wooden legs, &c.
148. Wild Tamarind (*Pithecolobium filicifolium*).—Lofty tree. Used for house-building, very generally for flooring, &c. It takes a fine polish.
149. Yellow Sanders (*Bucida capitata*).—Height from 50 to 60 ft., trunk 2 ft. in diameter. Wood close-grained and durable. Used for furniture and fancy work. This is the satinwood of the West Indies.
150. Juniper (*Juniperus barbadensis*).—Height from 50 to 60 ft., diameter of trunk 2 to 3 ft. Used for house-building, posts, beams, rafters, shingles, and fancy work. One of our most durable woods ; grows only in the mountains at from 2,000 to 5,000 ft. above the sea.
151. Yacca (*Podocarpus coriacea*).—Height 50 ft., trunk 2 ft. in diameter. Used for fancy work and for inside work. Does not stand damp. One of the most beautiful woods of the island. Grows on the mountains at from 3,000 to 6,000 ft. above the sea.
152. Spanish Elm (*Cordia gerascanthoides*).—Height 40 ft., diameter of trunk 2 ft. Hard and cross-grained ; very durable. Used in fancy work, turning, &c.
153. Pear (*Persea gratissima*). Height from 60 to 80 ft., diameter of trunk 2 ft. and upwards. Used for inside work in house-building. Does not stand damp. Takes a fine polish.

154. Prickly Yellow (*Zanthoxylum Clava-Herculis*).—Height from 40 to 60 ft., trunk 2 ft. in diameter. Used for house-building.
155. Pimento (*Pimenta vulgaris*). Height 30 ft., diameter of trunk 1 ft. Hard and close-grained. Used for fancy work.
156. Indian Teak (*Tectona grandis*).—Cultivated in the Botanic Gardens, where a small plantation of it has been recently formed.
157. Breadfruit (*Artocarpus incisa*).—Wood suited for fancy work, but soft.
158. Botany Bay Oak (*Casuarina stricta*).—Cultivated for ornament. Wood very hard, heavy, and durable. An extract of the bark forms a valuable dye.
159. Guanga (*Calliandra Saman*).—Height 60 ft., diameter of trunk from 4 to 5 ft. This wood has been favourably recommended for gun carriages.
160. Cactus (*Cereus Swartzii*).—Small stem. Used for fancy work. Peculiar as a wood from the cactus. Soft, and takes a fine polish.
161. Black Mangrove (*Avicennia nitida*).—Small tree. Wood durable. Used for fancy work, and for knees of boats.
162. Candlewood (*Cassia emarginata*).—Small tree. Used for fancy work.
163. Guava (*Psidium pyriferum*).—This has been used for "bold engraving, and blocks for large letters."
164. Coffee (*Coffea Arabica*).—Shrubby tree. Has been tried as a substitute for box, for engraving. Well adapted for ornamental carving and inlaying.
165. Cocoa Nut Palm (*Cocos nucifera*). This is the porcupine wood of commerce. Section of stem exhibited.
166. Date Palm (*Phoenix dactylifera*).—Used for fancy work. Transverse section of stem exhibited.
167. Fustic (*Maclura tinctoria*).—Large tree. Used in cabinet work.
168. Acacia Catechu.—In India "this wood is considered more durable than teak, " and is used for house posts, spear and sword handles, bows, &c. &c."
169. Corkwood (*Anona palustris*).—Small tree. Light wood. Used for making wooden legs.
170. Timber Sweetwood (*Nectandra sanguinea*).—Large tree. Well adapted for inside work. Used for boards, rafters, posts, &c. Free-grained and easily worked.
171. Bastard Cedar (*Guazuma tomentosa*).—Tree 30 ft. high, trunk 1½ ft. in diameter. Wood light. Used for staves. In Ceylon it is extensively used for making furniture, and by coachbuilders for panels.
172. Prune (*Prunus occidentale*).—Large tree. Used for millwork, &c.
173. Rose Apple (*Jambosa vulgaris*).—Soft and elastic wood. Used for making ox-bows, &c.
174. Bloodwood (*Laplacea hæmatoxylon*).—Hard and durable wood. Very little used.
175. Ironwood, White (*Mouriria sp.*).—Hard and durable wood. Not much used.
176. Blue Gum (*Eucalyptus globulus*).—Grown at 5,000 ft. above the sea. From seed it has attained a height of 50 ft. in five years, it having been imported in 1870. This is the well-known Blue Gum tree of Tasmania. Recommended for its antiseptic properties, and considered one of the best of timber trees.
177. Divi-divi (*Cæsalpina coriaria*).—Small spreading tree. This wood is harder than Jamaica ebony. Very durable, and adapted to many purposes to which a good hard wood is applicable.
178. Candle Wood, Mountain (*Amyris sp.*).
179. Rose Wood (*Gomphia?*).—Hard and heavy. Not much used.
180. Soap Wood (*Clethra tinifolia*).—Used for posts, rafters, &c.
181. Grey Sanders (?).
182. Bamboo (*Bambusa vulgaris*).—This gigantic grass grows from 50 to 60 ft. in one season. It is naturalised in all parts of the island. Extensively used for making fences, and as laths for building negro huts, and for numerous other purposes.

#### SHINGLES.

183. Juniper Shingles (*Juniperis barbadensis*).—Lasts from 50 to 60 years either in wet or dry climate.
184. Cedar Shingles (*Cedrela odorata*).—Lasts either in wet or dry climate from 20 to 30 years.

#### TIMBERS USED IN CARRIAGE AND CART BUILDING.

185. Lance Wood (*Oxandra virgata*).—The number of lance wood spars exported in 1874 was 25,393.

186. Dog Wood (*Piscidia erythrina*).—Used for felloes and naves, for which it is said to be more durable than hickory.
187. Calabash (*Crescentia cujete*).—Used for felloes, for which it is well adapted. It is tough, elastic, and very durable.
188. Braziletto (*Peltophoreum linnæi*).—Used for spokes. Strong and very durable.

#### TIMBERS USED OR VALUABLE FOR RAILWAY SLEEPERS.

189. Cashaw (*Prosopis juliflora*).—On the Jamaica Railway this is almost exclusively used for sleepers, and it is found to last from 30 to 40 years. These could be profitably produced at 3s. each.
190. Lignum-vitæ (*Guaiacum officinale*).—This is extensively used for sleepers on the Panama Railway. For this purpose it would probably last a century, and it is therefore, perhaps, the most enduring of all timbers. Five hundred trees could be grown to the acre, each of which at the end of 15 years would probably be worth 8s. The cost of Australian sleepers in India is 8s. each.

#### TIMBER FOR BOATBUILDING.

191. Cashaw (*Prosopis juliflora*).—For timber of vessels this is very durable. The timbers of a vessel of 150 tons, built in this island, on being broken up after 21 years' service, were found perfectly sound.

#### FIBRES.

192. China Grass (*Bœhmeria nivea*).—The valuable "Rhea" fibre grows with great luxuriance in humid parts of the island. At the Botanical Garden here a plot of it was experimented upon a few years ago and it yielded five crops in the year, producing at the rate of nearly one ton of prepared fibre per acre. The great desideratum here in order to ensure its extensive culture is a machine for the extraction of the fibre.
193. Sisal Hemp (*Agave Sisalana*).—Cultivated to a small extent. The fibre is said to be nearly as strong as "Manilla Hemp." This plant thrives on worn-out land, and could be easily cultivated to a large extent, but a machine is necessary for the extraction of the fibre. One plant of average size yields 6 lbs. of fibre, and 600 to the acre would give a crop of at least 3,000 lbs., producible every five years. A sample of this grown in the Botanical Garden was sent to England in 1870, and was valued at 60l. per ton, and considered superior to any Sisal hemp imported from Mexico.
194. American Aloe (*Agave Americana*).—Abundant on the dry hills. Strong fibre, and well adapted for cordage.
195. Pine Apple (*Ananassa sativa*).—A very strong and fine white fibre, which in the East is woven into the finest fabrics. The fibre endures long in water.
196. Pinguin (*Bromelia penguin*).—Abundant in arid places, possessed of similar properties to the pine apple fibre, and likewise admirably adapted for cordage.
197. Yercum (*Calotropis gigantea*).—Grows on the most arid and barren places in the island. Considered one of the strongest and best fibres of India. Said to be well adapted for prime warp yarns. Resists moisture for a long time.
198. Bowstring Hemp (*Sansevieria zeylanica*).—In certain parts of the East the best bowstrings are made of this; hence the name. The fibre is fine and tenacious. In India it is estimated that  $1\frac{1}{2}$  ton of clear fibre could be reaped yearly from an acre. Grows in arid places.
199. Plantain (*Musa paradisiaca*).—Vast numbers of the succulent stems of plantain and banana are cut down yearly after reaping the fruit, and allowed to rot on the ground, instead of being utilised, as they well might be, as a valuable fibre.
200. Banana (*Musa sapientum*).—Of equal value to the preceding.
201. Screw Pine (*Pandanus spiralis*).—Fibre from the leaves. Used in some countries for making cordage sacks, &c.
202. (*Pandanus odoratissima*).—Aerial roots.
203. Kittul (*Caryota urens*).—Cultivated in the Botanical Gardens. This fibre is obtained from the leaf-stalks of this palm. It is very strong and durable.
204. Coir (*Cocos nucifera*).—Obtained from the husk of the cocoa-nut. Notwithstanding that there are about a million of trees in the island, only a very small quantity of coir is prepared for use, the remainder, which if utilised

- would be worth at least 30,000*l.* a year, is allowed to rot on the ground. The coir is used to a small extent for stuffing mattresses, for which it is well adapted, and for making a few mats and brushes.
205. Bamboo (*Bambusa vulgaris*).—
206. Antidote Cacaoon (*Feuillea cordifolia*).—The twining stems of this climber are from six to twelve inches in diameter, and hundreds of feet long. The whole stem is composed of a coarse fibre. The fibrous structure of the stem is anomalous in an exogenous plant. The stem abounds with dyes of various colours.
207. Vegetable Hair (*Tillandsia usneoides*).—The epiphytal plant from which this is prepared is common in dry parts of the island, but it is never utilised.
208. Ejoo or Gomuto Fibre (*Arenga saccharifera*).—Cultivated in the Botanical Garden. Sample obtained from one plant. This horse-hair like fibre is yielded spontaneously on the margins of the sheaths of this palm. It is well known in Eastern commerce, and "is celebrated both for its strength and for its imperishable nature even when exposed to wet."
209. Dagger Plant (*Yucca aloifolia*).—Strong fibre.
210. (*Sida dumosum*).—Common weed.
211. (*Sida periplocifolia*).—Common weed.
212. (*Sida sp.*).—Common weed.
213. (*Sida mollis*).—Common weed.
214. (*Malachra capitata*).—Common weed.
215. Sorrel (*Hibiscus sabdariffa*).—Cultivated. Strong fibre.
216. Ochra (*Abelmoschus esculentus*). Cultivated. Strong fibre.
217. Grass (?).—Common on dry hills. Said to be equal to "esparto" for paper making.
218. Cocoa-nut (*Cocos nucifera*).—Obtained from the midrib.
219. (*Synonium auritum*).

#### BASTS.

- Substitutes for the Lime Basts of Russia abound in Jamaica. In Russia one million lime trees are cut down annually for Bast, which is manufactured into mats, &c. From six to ten years are required to produce good Lime Bast. Some of our Bast trees grow with such celerity that they attain to a height of 20 feet in a single season.
220. Mahoe (*Paratium elatum*).—This is the Cuba bast of commerce.
221. Trumpet Tree (*Cecropia peltata*).—Used for making ropes. This could be produced at a very cheap rate. One plant would yield annually one pound of Bast, and 1,000 could be planted to the acre, thus yielding 1,000 lbs. with hardly any cultivation beyond the first planting.
222. Bastard Cedar (*Guazuma tomentosa*).—Ropes made of this are very strong.
223. Burn-nose Bark (*Daphnopsis tinifolia*).—Strong for ropes.
224. Cotton Tree (*Bombax ceiba*).—Strong bast. Rapid growth.
225. Lace Bark (*Lagetta lintearia*).—The inner bark of this tree consists of curiously interlaced layers of fibres. Cordage and hammocks are made of it. Much used for making D'Oyleys, and various descriptions of fancy work.
226. Baobab (*Adansonia digitata*).—The celebrated baobab of Africa. The bark of this tree furnishes one of the strongest of fibres, and this has given rise to the saying in Bengal, "As secure as an elephant bound with a baobab rope." The trunk of this tree is remarkable for its great diameter and short stature. This bark has been strongly recommended for paper-making material, and it can be constantly barked without losing its vitality.
227. Wild Cotton (?).—Grows rapidly.
228. Black Wild Cotton (?).—Grows rapidly.
229. White Wild Cotton (?).—Grows rapidly.
230. Silver Thatch (*Thrinax argentea*).—The leaves of this fan palm are extremely strong and tenacious, it abounds in several parts of the island. Used for thatching huts, and for making brooms and ropes. From Panama, Cuba, and Central America large quantities of the leaves of what is supposed to be this species are exported for making hats. It is also supposed that it is this leaf that is manufactured into the so-called "straw hats" in Columbia, which are largely exported to the United States.
231. Silk Cotton (*Bombax ceiba*).—Obtained from the capsule of this tree, which is one of the largest in the colony. The only use made of these silky hairs is for stuffing cushions, &c. The wood is very soft, and is sometimes used for making canoes.
232. Down Tree (*Ochroma lagopus*).—This, like the preceding, is a beautiful silk cotton. Used for stuffing pillows, &c.

233. *Yerum* (*Calotropis gigantea*).—This silky down could easily be obtained in considerable quantity. Owing to the short fibre it is difficult to utilise these downy substances.
234. *Cotton* (*Gossypium* var).—This sample is obtained from a plant growing spontaneously near Kingston.

#### MEDICINAL SUBSTANCES.

##### *Cinchona Barks.*

235. *Yellow Bark* (*C. calisaya*).
236. *Red Bark* (*C. succirubra*).
237. *Crown or Loxa Bark* (*Cinchona officinalis*).
238. *Jalap* (*Exogonium purga*).
239. *Bitter Wood or Quassia* (*Picræna excelsa*).—Lofty tree. The "bitter cups," which impart a bitter taste to the water left in them, are obtained from this wood. About 100 tons of this are exported yearly.
240. *Sarsaparilla* (*Similax sarsaparilla*).—The name of "Jamaica Sarsaparilla" originated from the fact of this island having been the central mart from which the drug, imported to it from Columbia, &c., was afterwards distributed over the world. There is still much uncertainty as to the precise species which yields the genuine "Jamaica Sarsaparilla." What is grown here fetches a fair price. It is cultivated and exported to a small extent.
241. *Senna* (*Cassia obovata*).
242. *Gum Guaiacum* (*Guaiacum officinale*).—A decoction of this wood is in common use here for rheumatism and skin diseases. The resin of commerce is obtained by incisions in the trunk, and by heating the wood it also exudes spontaneously.
243. *Aloes* (*Aloe vulgaris*).—This plant flourishes in sandy and arid places, and could be grown with little or no cultivation to a large extent.
244. *Simaruba Bark* (*Simaruba amara*).—Bark of root used as a tonic in diarrhoea and dysentery, &c. Small quantities are occasionally exported.
245. *Canella Bark* (*Canella alba*).—Used as a spice by the negroes. Aromatic stimulant and tonic.
246. *Bastard Cabbage Bark* (*Andira inermis*).—A powerful anthelmintic and narcotic. Used in the form of a powder, decoction, or extract. An overdose produces "vomiting, delirium, and fever." Lime juice is said to be an antidote for an overdose.
247. *Cassia Pods* (*Cassia fistula*).—Cultivated and frequently sold in the shops. A mild laxative.
248. *Adrie* (*Cyperus articulatus*).—A decoction of the rhizome is frequently used by the negroes as an anti-emetic. It has been used with advantage in cases of yellow fever to stop the black vomit. Its properties would appear to deserve investigation.
249. *Mexican Thistle* (*Argemone Mexicana*).—"The seeds possess acrid, narcotic, and purgative properties." They also contain a medicinal oil.
250. *Cow-itch* (*Mucuna pruriens*).—The well-known remedy for intestinal worms.
251. *Bitter Bush* (*Eupatorium villosum*).—A decoction or an extract of the leaves and twigs is used here in cases of fever, and its medicinal properties have been favourably recommended.
252. *Castor Oil*.—See oils.
253. *Fruit of Baobab* (*Adansonia digitata*).—This nut possesses medical properties that are valued by the Africans. A decoction of the nut is said to be used for dysentery.
254. *Kola Nut* (*Cola acuminata*).—This is perhaps the most prized of all the products of tropical West Africa, where it is largely used as an article of medicine, especially in diarrhoea and affections of the liver. 10,000 donkey loads of the seeds are conveyed to the interior annually. Negroes in Jamaica commonly carry seeds with them when travelling in order to allay hunger and to counteract the effects of bad water or derangement of the liver. The fresh nut contains a larger per-centage of theine than either tea or coffee, but when dried this principle is less abundant.
255. *Dogwood Bark* (*Piscidia erythrina*).—Used to intoxicate fish. A tincture of the bark of the root is a strong narcotic and diaphoretic.
256. *Baobab Bark* (*Adansonia digitata*).—This is stated to have been used with great success in miasmatic fevers and also in intermittent fevers. "It produces increased appetite and perspiration."
257. *Pomegranate Bark* (*Punica granatum*).—A valuable anthelmintic. Used as a decoction, or in powder. It is the root bark that is used in commerce.

## SPICES OR CONDIMENTS.

258. Pimento, Allspice, or Jamaica Pepper (*Eugenia Pimenta*).—Jamaica enjoys the monopoly of this product, as nearly all the article in commerce is furnished by Jamaica. It is extensively cultivated, the quantity exported averaging 50,000 cwts. The pimento tree furnishes walking sticks and umbrella handles that are in great request.
259. Ginger (*Zingiber officinale*).—Jamaica ginger is the finest in the world, and commands by far the highest prices. The quantity exported annually averages from 5,000 to 10,000 cwts. Great care is taken with the rhizomes after they are dug up, they being cleaned, scraped, and dried in the sun.
260. Nutmeg. (*Myristica moschata*).—This plant is only cultivated to a small extent, but there is a strong desire to extend its cultivation, as hundreds are being planted yearly. A few are exported.
261. Vanilla (*Vanilla planifolia*).—Cultivated at the Botanical Gardens.
262. Betel Nut (*Areca Catechu*). Cultivated as an ornamental tree. Highly astringent and aromatic. Extensively used in the East for its stimulating effect: upon the nervous system.
263. Chillies dried (*Capsicum annum*).—Grows with little or no care.
264. Cayenne Pepper.—Made from the preceding.

## TEA AND COCOA.

265. Assam variety of Tea (*Thea Assamica*).—Grown at the Government cinchona plantations.
266. Cocoa (*Theobroma Cacao*).—Formerly largely cultivated in the island, but now only to a small extent. The quantity exported averages 600 cwts.
267. Chocolate.—From cocoa grown in the island and manufactured in Kingston.
268. Coffee Leaf Tea.—Possesses similar properties to tea.

## DYES.

269. Logwood (*Hæmatoxylon Campechianum*).—Notwithstanding that this is an introduced plant, it has become so completely naturalised that it occupies a much larger area of land than any other plant in the colony. The extent of land covered by this product is not less than 200 square miles. From 60,000 to 100,000 tons are exported annually.
270. Fustic (*Maclura tinctoria*).—The average export of this product is 2,500 tons annually. Common in most parts of the island.
271. Candle Wood (*Cassia emarginata*).—This appears to be a new dyewood. 264 tons were exported in 1874. It is a small tree, and grows in dry savannahs.
272. Sappan Wood (*Cæsalphinia Sappan*).—This tree has been introduced upwards of 20 years, and its cultivation is slowly spreading, but not in sufficient quantity for export.
273. Logwood Extract.—Obtained from the Jamaica Dyewood Extract Company. This extract, as prepared by A. Lenormand, Esq., contains only the pure colouring matter of the wood. It is stated that the refuse of the wood, after it is operated upon, supplies sufficient fuel for the manufacture of the concrete. Manufactures of this character deserve encouragement in the island.
274. Cacaoon, antidote.—Extract from wood.
275. Prickly Yellow.—Extract from seeds, &c.
276. Oldenlandia Umbellata (?).—Extract from root.
277. Maiden Plum (*Comocladia integrifolia*).—Extract from twigs and leaves.
278. Annatto (*Bixa orellana*).—Used by silk-dyers and varnish-makers, and for colouring butter and cheese. In 1874, 22,338 lbs. were exported.
279. Turmeric (*Curcuma longa*).—The rhizome is made into powder and used for dyeing. It is also used in medicine, and in the composition of Curry Powder.

## TANNING SUBSTANCES.

280. Divi-Divi (*Cæsalphinia Coriaria*).—Produced by a small spreading tree. Cultivated to a small extent. Thrives in dry localities. Nearly sufficient is grown for our island manufacture of leather. Its cultivation for export might be carried on with great advantage.
281. Mangrove Leaves (*Rhizophora mangle*).—The leaves and twigs are largely used in the Kingston tanneries for manufacturing leather. All parts of these trees are rich in tanning. The bark has been used in medicine as an astringent.
282. Pimento Leaves (*Eugenia Pimenta*).—A patent has been recently taken out in Jamaica for the employment of pimento leaves as a tanning material.

283. Catechu Extract (*Acacia Catechu*).—Prepared by boiling the heart-wood, which is cut into chips and the liquid evaporated. It is highly astringent. It is extensively exported from India for the use of tanners. The plant is naturalised in Jamaica, and is common in dry localities.
284. Mangrove.—Extract from twigs and leaves.
285. Mangrove.—Extract from wood.
286. Mangrove, White.—Extract from twigs and leaves.

## TOBACCO AND CIGARS.

287. Nine samples of Tobacco, crop, 1876, the qualities corresponding to their respective numbers.—Obtained from Messrs. Thompson and Weitzmann. (See additional samples furnished by Messrs. Soutar & Co.)

## CANDIED FRUITS AND PRESERVES.

288. Rose Apple (*Jambosa vulgaris*).—Fruit excellent, with a strong odour of the rose. Probably this is the first time that it has ever appeared as a candied or preserved fruit. Uncultivated, but obtainable in great abundance. Rose water is distilled from the fruit.
- |  |  |
|--|--|
| 289. Cashew ( <i>Anacardium occidentale</i> ). | 302. Tamarinds ( <i>Tamarindus indica</i> ).     |
| 290. Seville Orange.                           | 303. Green Tamarinds.                            |
| 291. Lemon.                                    | 304. Ginger.                                     |
| 292. Cocoa-nut.                                | 305. Bilberry ( <i>Vaccinium meriodionale</i> ). |
| 293. Lime.                                     | 306. Guava Jelly.                                |
| 294. Bilimbi ( <i>Averrhoa Bilimbi</i> ).      | 307. Pine Apple Jam.                             |
| 295. Carambola ( <i>Averrhoa Carambola</i> ).  | 308. Mango Jam.                                  |
| 296. Pine Apple.                               | 309. Pine Apple Syrup.                           |
| 297. Pine Apple—sliced.                        | 310. Lemon Syrup.                                |
| 298. Guava.                                    | 311. Guava Syrup.                                |
| 299. Papaw ( <i>Carica papaya</i> ).           | 312. Ginger Syrup.                               |
| 300. Shaddock Marmalade.                       | 313. Mango Syrup.                                |
| 301. Coco Plums.                               |  |

## FRUITS PRESERVED IN ALCOHOL.

314. Avocado Pear (*Persea gratissima*).
315. Nutmeg (*Myristica moschata*).
316. Akee (*Blighia sapida*).
317. Pomegranate (*Punica granatum*).
318. Kola Nut (*Cola acuminata*).
319. Cherimoya (*Anona Cherimolia*).
320. Mammel Apple (*Mammea Americana*).

## PICKLES, &amp;c.

- |                        |                             |
|------------------------|-----------------------------|
| 321. Mango.            | 328. Lady Finger Pepper.    |
| 322. Mango Chutney.    | 329. Mixed Pickles.         |
| 323. Goat Pepper.      | 330. Mountain Cabbage.      |
| 324. Devil do.         | 331. Wild Cane and Peppers. |
| 325. Scotch-bonnet do. | 332. Cho-cho.               |
| 326. Cow do.           | 333. Cayenne Pepper.        |
| 327. Sweet do.         |                             |

## BASKETS, FANS, HATS, ORNAMENTAL WORK. &amp;c.

334. D'Oyleys and Fans, made of Lace Bark and Cabbage Palm.—Obtained from Mrs. Thos. Hendrick.
335. Basket made of the cuticle of the leaves of the Dagger plant (*Yucca aloifolia*).
336. Fans made of same.
337. Cuticle from which the flowers and fans are made.
338. Baskets made of leaves of a large Fan Palm (*Sabal umbraculifera*).
339. Fans made of same.
340. Hats made of same.
341. Table mats made of same.
342. Hat made of Yipi-yapa (*Carludovica insignis*).—An indigenous species of the plant from which the celebrated Panama hats are made.
343. Mat made of the leaf stalks of a Palm (*Thrinax parviflora*).
344. Mat made of the fibrous layers of the stem of Plantain (*Musa Paradisiaca*).—Most generally used by the negroes for beds.

345. Baskets made of Bamboo.—Most commonly used.  
 346. Baskets made of Supple Jack.—Commonly used, and durable.  
 347. Baskets made of Shells.  
 348. Razor Strops made of the flowering stem of *Agave Americana*.  
 349. Curry Brushes.—Made in the General Penitentiary.  
 350. Scrubbing Brushes.     "     "     "  
 351. Shoe Brushes.     "     "     "  
 352. Whitewash Brushes.     "     "     "  
 353. Door Mats.     "     "     "  
 354. Grugru (*Acrocomia sclerocarpa*).—Necklace, &c. made from the seeds of this palm.  
 355. Tortoise-shell Combs, Earrings, Brooch, Bracelet, &c.  
 356. Egg Cups made of fancy woods.  
 357. Napkin Rings made of fancy woods.  
 358. Necklace made of Job's Tears (*Coix lacryma*).  
 359. Necklace made of Soapberry (*Sapindus saponaria*).

#### ROPES.

- |                     |                             |
|---------------------|-----------------------------|
| 360. Sisal Hemp.    | 369. <i>Sida</i> species.   |
| 361. Bamboo.        | 370. <i>Sida mollis</i> .   |
| 362. Coir.          | 371. Red Tamarind.          |
| 363. Mahoe.         | 372. Burn-nose Bark.        |
| 364. Silver Thatch. | 373. Silk Cotton.           |
| 365. Bastard Cedar. | 374. Cocoa-nut, Leaf Stalk. |
| 366. Pinguin.       | 375. Grass (?).             |
| 367. Lace Bark.     | 376. Cacoon, antidote.      |
| 368. Wild Cotton.   |                             |

#### WALKING STICKS.

- |   |   |
|---|---|
| 377. Black Ebony.—( <i>Brya ebenus</i> .)         | 392. Coffee.  |
| 378. Green Ebony.                                 | 393. Orange.  |
| 379. Grugru-nut.                                  | 394. Lime.  |
| 380. Cocoa-nut.                                   | 395. Yacca.   |
| 381. Pimento.                                     | 396. Jack Fruit.  |
| 382. Logwood.                                     | 397. Wild Genip.  |
| 383. Ironwood.                                    | 398. Prickly Yellow.  |
| 384. Fiddlewood.                                  | 399. Pepper Elder.  |
| 385. Juniper.                                     | 400. Joint-wood.  |
| 386. Wild Jack Fruit.                             | 401. Black Wattle.  |
| 387. Supple Jack ( <i>Paulinia Jamaicensis</i> ). | 402. White Toby (?).  |
| 388. Guava.                                       | 403. Tree Fern Stem.  |
| 389. Timber Sweet-wood.                           | 404. Bamboo.  |
| 390. Bogum (?).                                   | 405. Bamboo Whip.—Thong and handle,<br>made from one piece of bamboo. |
| 391. Yellow Sanders.                              |   |

#### RULERS.

406. *Lignum-vitæ*.  
 407. Satin Wood.  
 408. Ebony.

#### PAPER STOCK AND "HALF-STUFF."

(As roughly prepared by *Wm. Mcwatt, Esq.*)

409. Bamboo Paper Stock.  
 410. Bamboo "Half-Stuff," from young stems.  
 411. Do. do. from old stems.  
 412. Pinguin do.  
 413. (*Sida* Sp.) do.  
 414. Lace Bark do.  
 415. Cocoa-nut, from leaf do.  
 416. Grass (?) do.  
 417. Silk Cotton Tree, from wood do.

## LIQUEURS.

- 418. Orange Wine.—From Messrs. Alberga and Mitchell, merchants.
- 419. Orange Bitters.
- 420. Ginger Wine.
- 421. Wine Bitters.
- 422. Pimento Dram.
- 423. Prune Dram.
- 424. Essential Oil of Pepper.
- 425. Orange Wine.—From Messrs. Wray and Nephew, merchants.
- 426. Ginger Wine.
- 427. Pimento Dram.
- 428. Stomachic Bitters.
- 429. Creme de Noyeau.

## HORTICULTURE.

*Economic Plants.*

- 430. *Cinchona calisaja*
- 431.     "     *succirubra* } (Species rich in quinine, &c.)
- 432.     "     *officinalis* }
- 433. *Croton tiglium* (Croton oil plant).
- 434. *Curcas purgans*.
- 435. *Andira inermis* (Bastard cabbage).
- 436. *Exogonium purga* (Jalap).
- 437. *Cypripus articulatus* (Adrue).
- 438. *Smilax sarsaparilla* (Sarsaparilla).
- 439. *Coculus indicus*.
- 440. *Cola acuminata* (Kola nut).
- 441. *Adansonia digitata* (Baobab).
- 442. *Aloe vulgaris* (Aloes).
- 443. *Swietenia mahogani* (Mahogany).
- 444. *Tectona grandis* (Teak).
- 445. *Cedrela odorata* (Cedar wood).
- 446. *Juniperus barbadensis* (Pencil cedar).
- 447. *Podocarpus coriacea* (Yacca).
- 448. *Prunus occidentale* (Prune tree).
- 449. *Nectandra sanguinea* (Sweet wood).
- 450. *Catalpa longisiliqua* (Yoke wood).
- 451. *Oxandra virgata* (Lance wood).
- 452. *Paritium elatum* (Mahoe).
- 453. *Thespesia populnea* (Sea side mahoe).
- 454. *Clethra tinifolia* (Soap wood).
- 455. *Calophyllum calaba* (Santa Maria).
- 456. *Piscidia erythrina* (Jamaica dogwood).
- 457. *Eucalyptus globulus* (Blue gum).
- 458. *Sapota sideroxylon* (Bullet tree).
- 459. *Ceanothus chloroxylon* (Cogwood).
- 460. *Crescentia cujete* (Calabash).
- 461. *Hæmatoxylon campechianum* (Logwood).
- 462. *Cæsalpinia coriaria* (Divi-divi).
- 463. *Rhizophora mangle* (Mangrove).
- 464. *Coccoloba uvifera* (Sea side grape).
- 465. *Indigofera tinctoria* (Indigo).
- 466. *Bixa orillana* (Annatto).
- 467. *Cocos nucifera* (Cocoa-nut).
- 468. *Blighia sapida* (Akee).
- 469. *Artocarpus incisa* (Bread fruit).
- 470.     "     *integrifolia* (Jack fruit).
- 471. *Mangifera indica* (Mango).
- 472. *Citrus aurantium* (Orange).
- 473. *Ananassa sativa* (Pine-apple).
- 474. *Musa sapientum* (Banana).
- 475.     "     *paradisica* (Plantain).
- 476.     "     *ensete* (Abyssinian banana).
- 477. *Vaccinium meridionale* (Bilberry).
- 478. *Carica papaya* (Papaw).
- 479. *Mammea americana* (Mammee apple).
- 480. *Psidium guava* (Guava).

481. *Psidium chinense* (China guava).
482. *Persea gratissima* (Avocado pear).
483. *Phoenix dactylifera* (Date).
484. *Eriobotrya japonica* (Loquat).
485. *Anona cherimolia* (Cherimoya).
486. " *muricata* (Soursop).
487. *Tamarindus indica* (Tamarind).
488. *Chrysophyllum cainito* (Star apple).
489. " *nigra* (Star apple).
490. *Lucuma* " *mammosa* (Mammee sapota).
491. *Aleurites triloba* (Candleberry).
492. *Sapota achras* (Sapodilla).
493. *Melicocca bijuga* (Genip).
494. *Averrhoa carambola* (Carambola).
495. *Passiflora quadrangularis* (Granadilla).
496. *Caryocar nucifera* (Souari nut).
497. *Opuntia tuna* (Prickly pear).
498. *Terminalia cattapa* (Almond).
499. *Jambosa vulgaris* (Rose apple).
500. " *malaccensis* (Otaheite apple).
501. *Sechium edule* (Cho-cho).
502. *Myristica moschata* (Nutmeg).
503. *Caryophyllus aromaticus* (Clove).
504. *Vanilla aromatica* (Vanilla).
505. *Piper nigrum* (Black pepper).
506. *Eugenia pimenta* (Pimento).
507. *Cinnamomum verum* (Cinnamon).
508. *Areca catechu* (Betel nut).
509. *Capsicum annum* (Chillies).
510. *Bæhmeria nivea* (China grass).
511. *Agave sisalana* (Sisal hemp).
512. *Bromelia Pinguin* (Pinguin).
513. *Ochroma lagopus* (Down tree).
514. *Cecropia peltata* (Trumpet tree).
515. *Dioscorea alata* (Yam).
516. " " var. (Yam).
517. *Maranta arundinacea* (Arrowroot).
518. *Canna warzewitzia* (Arrowroot).
519. *Coffea arabica* (Coffee).
520. " *liberica* (Liberian coffee).
521. " var. (from Cape Coast).
522. *Theobroma cacao* (Cocoa).
523. *Thea assamica* (Assam Tea).
524. *Attalea cohune* (Cohune oil).
525. *Elæis guineensis* (Oil palm).
526. *Bactris plumeriana* (Palm).
527. *Oreodoxa oleracea* (Mountain cabbage).
528. *Thrinax parviflora* (Thatch palm).
529. *Urania madagascariensis* (Traveller's tree).
530. *Paulinia domingensis* (Supple jack).
531. *Andropogon muricatus* (Khus-khus).
532. *Andropogon schœnanthus* (Lemon grass).
533. *Saccharum officinarum* (Sugar-cane).
534. *Abelmoschus esculentus* (Okra).
535. *Hura crepitans* (Sand-box).

#### FRUITS.

- |                                |                    |
|--------------------------------|--------------------|
| 536. Pine Apples.—Ripley.      | 547. Bread Fruit.  |
| 537. " Sugar Loaf.             | 548. Sapodilla.    |
| 538. " Black Jamaica.          | 549. Mammel Apple. |
| 539. Bananas.                  | 550. Cocoa-nut.    |
| 540. Oranges.                  | 551. Cho-cho.      |
| 541. Shaddocks.                | 552. Jam, Indian.  |
| 542. Citrons.                  | 553. " Affoe.      |
| 543. Forbidden Fruit.          | 554. " Negro.      |
| 544. Limes.                    | 555. Coco.         |
| 545. Mangoes (four varieties). | 556. Sweet Potato. |
| 546. Jack Fruit.               | 557. Plantain.     |

## DRIED FERNS.—100 Species.

558. *Cyathea gracilis*. *C. serra*. *C. tenera*. *C. muricata*. *C. tussacii*.  
*Alsophilla nitens*. *A. armata*. *Hemitelia horrida*.  
*Marattia alata*.  
*Polypodium squamatum*. *P. pectinatum*. *P. trichomanoides*. *P. crassifolium*. *P. phyllitidis*.  
*P. loriceum*. *P. angustifolium*. *P. elongata*.  
*P. suspensum*. *P. cultratum*. *P. hastifolium*.  
*Dicksonia conifolia*. *D. dissecta*.  
*Aspidium pubescens*. *A. villosum*. *A. counterminum*. *A. effusum*.  
*A. asplenioides*. *A. macrophyllum*.  
*Aspidium mucronatum*. *A. apiifolium*. *A. trifoliatum*. *A. denticulatum*.  
*A. plaschnikianum*.  
*Gymnogramme sulphurea*. *G. ruffa*. *Gymnogramme calomelanos*. *G. tartarea*. *G. chaerophylla*.  
*Cheilanthes microphylla*. *C. marginata*. *C. radiata*.  
*Notholaena trichomanoides*. *N. ruffa*.  
*Nephrolepis pectinata*. *Hypolepis purdieana*.  
*Mertensia furcata*.  
*Adiantum concinnum*. *A. kunzeanum*. *A. cubense*. *A. macrophyllum*.  
*A. tenerum*. *A. pulverulentum*. *A. Wilsoni*. *A. obliquum*. *A. trapziforme*. *A. cristatum*.  
*Asplenium conchatum*. *A. pteropus*. *A. species*. *A. formosum*. *A. dentatum*. *A. grandifolia*. *A. erosum*. *A. serratum*. *A. fragrans*.  
*A. auritum*. *Asplenium semihastatum*. *A. cultrifolium*. *A. myriophylla*.  
*A. furcatum*. *A. rhizophoreum*.  
*Pteris longifolia*. *P. scalaris*. *P. incisa*. *P. arachnoides*. *P. laciniata*.  
*P. grandifolia*. *P. heterophylla*.  
*Taenites angustifolia*. *Vittaria lineata*.  
*Davallia inequalis*. *Lomaria procera*.  
*Panagramme lanceolata*.  
*Saccaloma elegans*. *Fadenia prolifera*.  
*Lophosoria pruinosa*. *Blechnum occidentale*.  
*Trichomanes bancrofti*. *T. scandens*. *T. crispum*.  
*Hymenophyllum hirtellum*.  
*Gymnopteris nicotianifolia*. *G. aliena*.  
*Acrosticum squamosum*. *A. vestitum*. *A. viscosum*. *Lygodium volubile*.  
*Anemia hirsuta*. *A. phyllitidis*.  
*Botrychium virginianum*.

*Exhibited by Private Exhibitors.*

HON. ROBERT NUNES.

559. Rum from Lansquinet Estate.  
 560. Lace Bark from Pantrepant Estate.

JOHN BRASS AND SON.

561. Double set of Carriage Harness, of native workmanship.  
 562. Riding Saddle.  
 563. Honey.  
 564. Beeswax—bleached and unbleached.

CHARLES GRANT, Esq.

565. Chewstick and Chewstick Powder.  
 566. Indian Odontine.  
 567. Beeswax—bleached.  
 568. Solution of Bisulphite of Lime.

P. DESNOES AND SON, MERCHANTS.

569. Rum—old, 3 samples.  
 570. Rum—2 samples from New Works Estate.

571. Ginger Cordial—2 samples.  
 572. Orange Wine—2 samples.  
 573. Pimento Dram.

MESSRS. SOUTAR & CO.

574. Cigars—22 samples.  
 575. Tobacco—3 samples.

MRS. G. BROOKS.

576. D'Oyleys and Fans made from Lace Bark (*Lagetta lintearia*) and the Spathe of Cabbage Palm—(*Euterpe oleracea*).

W. S. RICHARDS, Esq.

577. Coffee—Rose Hill.

JAMES MELVILLE, Esq.

578. Rum—Penants Estate.  
 579. Falernian Wine.

CHAS. GADPAILLE, Esq.

580. Rum.

P. E. AUVRAY.

581. Odontine.  
 582. Bleached Wax.

ALEX. KING & Co.

583. 2 Samples Table Rum.  
 584. 1 Do. Lime Juice.

WM. B. ESFEUT, Esq.

585. Rum—3 samples.  
 586. Cigars—5 samples.

WM. FISHER, Esq.

587. Sole Leather tanned with Pimento leaves.  
 588. Tannin Concrete from same.

DR. MAJOR.

589. Nutmegs in Alcohol.

A. FEGAN, Esq.

590. Bleached Wax.

WM. REID.

591. Assortment of Walking Sticks.  
 592. Razor Strops (*Agave Americana*).  
 593. Quassia Cups (*Quassia amara*).  
 594. Egg Cups made of various woods.  
 595. Napkin Rings do. do.  
 596. Cocoa-nut Cups.

JAMES GALL, Esq.

597. Fern Album.

MRS. F. NASH.

598. Basket Flowers, Hat, Fan, Mats, &c. made of Spanish Dagger (*Yacca aloi-  
folia*).  
 599. Hat, Fan, Scarf, Mats, &c. made of Lace bark (*Lagetta lintearia*).

- 600. Basket of Ferns.
- 601. Seed Necklaces.
- 602. Fans made of Palm Spathe.

*From Grand Turk, Turks and Caicos Islands.*

MESSRS. FRITH AND MURPHY.

- 603. Salt prepared by solar evaporation and crystallisation.

JOHN NEY REYNOLDS.

- 604. Salt prepared by solar evaporation and crystallisation.

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**MAURITIUS.**

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**THE PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**Manager at Mauritius of the Collection, J. HORNE, ESQ.**

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**Superintended at Philadelphia by the BRITISH EXECUTIVE  
COMMISSIONERS.**

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**Agents, MESSRS. PETER WRIGHT and SONS, 307, Walnut  
Street, Philadelphia.**

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# MAURITIUS.

## REPORT on the ISLAND of MAURITIUS.

Mauritius is a small island in the Indian Ocean just within the tropics, about 500 miles east of Madagascar, being situate in  $20^{\circ}$  to  $20^{\circ} 30'$  south latitude, and in longitude east  $57^{\circ} 17'$  to  $57^{\circ} 46'$ . Formerly in the possession of the French, and known as Ile de France, this island became a Crown colony of Great Britain by capitulation in 1810. It is entirely of volcanic origin, and viewed from the ocean presents a most picturesque appearance. Indeed by recent writers Mauritius has been styled the "Gem of the Ocean." Port Louis is the capital of, and the only city in, Mauritius. It contains about 66,000 inhabitants, and covers an area of about 10 square miles. It is surrounded on the land side by a ridge of mountains which takes the form of a horse-shoe round three sides of the city, and has a fine natural harbour, capable of affording anchorage to a large number of vessels. The mountains in the island, which consist of basalt, tufaceous rock, and lava, vary in height from 2,000 to 3,000 feet. In the centre of the island the table land has an elevation of about 1,500 feet above the sea, the distance from the coast being about 15 miles. In the south and south-west portions the features of the country are rugged. The districts in the centre of the island are flat, or slightly undulating, and are covered with a red ferruginous earth. The soil, where it is cultivated, is unusually rich and fertile, but it varies greatly in character, and speedily becomes exhausted. Of late years many thousands of acres in the low-lying lands in the north and north-western districts, which were formerly very productive in their sugar yield, have become waste and unemployed; and it is a question open to discussion whether this has occurred from improvident working of the estates, from scarcity of rain, or from exhaustion of the soil.

Physical features.

The mean temperature in the shade for groups of five years has been proved to be about  $77^{\circ}$ . The total area of the island is 432,680 acres, or about 708 square miles, of which there are under—

Cane cultivation, about -	-	230 square miles.
Planted with maize, manioc, &c.	-	35 "
Forest and pasture -	-	168 "
Waste and uncultivated	-	285 "
Total -		<u>708</u>

For so small an area the population of Mauritius is extraordinary. According to the census of 10th April 1871 it amounted to 316,042 souls, or 446 per square mile (against 180,823 souls in 1851), whilst that of Great Britain and Ireland is estimated at 253, and that of Belgium, the most populous country in Europe, at 430 per square mile. The population is very mixed. Persons of every nationality are found in the island. Although a British dependency, the proportion of English residents bears a very small ratio to the rest of the inhabitants. Out of the population of 316,042, it appears that of colonists born in the United Kingdom there were only 964, of those born in India 148,300, and of those born in Mauritius 143,938. America and Australia, France, China, Mozambique, &c., claim the remainder.\* Between 1843 and 1873 403,050 Indian immigrants have been introduced into the colony.

Population.

\* Census Returns, 1871.

**Public health.**

With regard to the health of the colony, the acting Governor recently wrote as follows: "I am afraid it would be fallacious to expect that what with its "over-populated state, to which thousands are annually added, and with a "malarial fever that has already so terribly proved what malignant power it "can assume, always lurking in an endemic form through the island, it will "be ever likely again to resume its once celebrated salubrity."

The deaths and death-rate of each of three years, from 1873 to 1875 inclusive, in the total population have been—

1873	-	-	-	33·0	per 1,000.
1874	-	-	-	29·0	"
1875	-	-	-	27·0	"

**Produce.**

The welfare of the community depends entirely upon the cultivation of a single staple article of valuable produce. With the exception of sugar, the colony raises scarcely anything required for its own consumption, but exports nearly its whole product, and imports all articles required for its food and for other necessities. Everything grown is sent to Port Louis for exportation, and everything required on the estates is brought back from that town. Until some few years ago the sugar from the estates near the coast was conveyed to Port Louis by schooners, and from other parts of the island it was carted to town by mules. These carts conveyed about 30 or 40 cwt. of sugar each, and required three or even four mules; but in ascending from Port Louis to the centre of the island the return load only averaged about 12 or 13 cwt. per cart. Conveyance by schooners, though cheap, depreciated the sugar, owing to exposure, and to the losses consequent on transshipments and pillage, while the cartage was for the reasons mentioned very expensive, notwithstanding the excellent condition of the roads.

**Means of conveyance.****Railway communication.**

The necessity for railway communication was therefore much felt by the Government, and after careful investigation the construction of a railway was recommended to and adopted by the English Government in May 1861. It was at first hoped that a private company would undertake it, but as no suitable offer was made it was decided that the works should be carried out by the local Government, the funds being obtained from some large balances in hand, and by the issue of 1,000,000*l.* of colonial debentures, bearing interest at six per cent., and secured by a sinking fund. The total sum which the colony thus became responsible for was at the outset 78,000*l.* a year.

**Two lines.****Gradients, and highest level attained.**

The Mauritius railways consist of two lines, the North and Midland, having a common terminus in Port Louis. The north line, 31 miles in length, runs to Grand River, S.E., and was opened for traffic in May 1864. It comprises 8½ miles of cutting, 26 miles of embankments, and 14 bridges varying from 25 to 80 feet in span, built of stone or iron. The maximum gradient on this line is 1 in 80 feet. The highest level attained is 329 feet above the sea. This line provides for the traffic of the north and east sides of the island.

The Midland line traverses the centre of the island, and attains an elevation of 1,822 feet above the sea level. The total length is 35 miles, and the gradients are exceptionally steep, 1 in 27 constantly occurring. In all there are 21 bridges, the most remarkable of which is the viaduct over Grand River, in five spans of 126 feet each, and 140 feet above the bed of the river.

This line provides for the traffic of the central and north-eastern portions of the island, whilst there is a branch line in course of construction called the Savaune Railway, branching off from the main line, and running in a south-westerly direction for about 12 miles, which will meet the wants of the south-westerly portions. It is further contemplated to open another branch to run from the Midland in an easterly direction, and provide for the wants of a fertile central district lying between the Midland and North lines.

**Revenue and expenditure.****REVENUE AND EXPENDITURE.**

	Revenue.		Expenditure.	
1855	-	-	£348,453	-
1856	-	-	395,103	-
1857	-	-	451,209	-
1858	-	-	553,166	-
1859	-	-	609,516	-
				£317,839
				326,581
				380,501
				521,514
				572,479

		Revenue.		Expenditure.
1860	-	£553,419	-	£500,853
1861	-	482,788	-	468,849
1862	-	492,322	-	584,495
1863	-	550,618	-	528,546
1864	-	638,067	-	602,279
1865	-	646,730	-	667,716
1866	-	639,576	-	700,048
1867	-	534,992	-	642,602
1868	-	577,686	-	641,272
1869	-	595,024	-	575,180
1870	-	608,166	-	591,579
1871	-	616,952	-	600,961
1872	-	703,159	-	650,327
1873	-	690,081	-	657,110
1874	-	720,130	-	727,063
1875	-	692,894	-	775,836

Public debt 895,600*l.*, bearing interest 6 per cent.

The mean revenue of the island for the 10 years ending 1872 was 611,097*l.*

The mean expenditure for the same period was 640,051*l.*

#### IMPORTS AND EXPORTS.

		Imports.		Exports.	Imports and exports.
1855	-	£1,356,301	-	£1,848,091	
1856	-	2,154,406	-	1,804,123	
1857	-	2,391,106	-	2,303,786	
1858	-	2,785,352	-	2,209,076	
1859	-	2,440,821	-	2,559,699	
1860	-	2,238,846	-	2,661,098	
1864	-	2,582,979	-	2,249,740	
1865	-	2,141,350	-	2,629,519	
1866	-	2,048,000	-	2,501,000	
1867	-	1,720,000	-	2,003,800	
1868	-	2,000,069	-	2,321,243	
1869	-	1,619,906	-	2,601,657	
1870	-	1,953,993	-	2,049,987	
1871	-	1,807,382	-	3,053,054	
1872	-	2,437,512	-	3,177,301	
1873	-	2,454,101	-	3,375,401	
1874	-	2,671,109	-	3,020,422	
1875	-	2,194,824	-	2,522,099	

The value of imports and exports since 1866 is exclusive of specie.

The quantities and value of sugar exported during the nine years ending 1875 were—

		Tons.	Value.	Average Price per cwt.
			£	s. d.
1867	-	100,000	2,156,950	18 4
1868	-	99,000	2,143,166	21 10
1869	-	107,000	2,599,815	22 10
1870	-	102,000	2,549,881	24 11
1871	-	123,000	2,819,944	23 7
1872	-	122,288	2,817,221	23 2½
1873	-	111,718	2,882,590	24 11
1874	-	98,888	2,293,214	23 8
1875	-	87,449	1,939,378	21 4½

The following table shows the exports of that article in 1875 :—

EXPORTS of SUGAR from the Colony of Mauritius in the Year 1875.

Countries to which exported.	Quantities.			Value in Sterling.	
	Produce and Manufacture of the Colony.				
	In British Vessels.	In Foreign Vessels.	Total.		
	lbs.	lbs.	lbs.	£	s. d.
United Kingdom - . . . .	49,951,152	4,855,450	54,806,602	541,646	13 0
Australasia - . . . .	45,945,149	7,579,617	53,524,766	600,498	6 5
Cape of Good Hope - . . . .	3,122,884	2,581,870	5,704,754	56,521	0 9
Continental India - . . . .	44,637,473	17,209,577	61,837,050	697,208	1 6
Dependencies of Mauritius - . . . .	143,524	—	143,524	1,719	11 0
St. Helena - . . . .	22,539	—	22,539	220	0 0
Singapore - . . . .	—	208	208	2	0 0
Denmark - . . . .	—	1,658,456	1,658,456	16,000	0 0
France - . . . .	—	2,033	2,033	25	12 0
Italy - . . . .	2,125,046	—	2,125,046	11,100	0 0
Madagascar - . . . .	49,534	8,617	58,151	612	3 0
Reunion Island - . . . .	—	145	145	2	8 0
Zanzibar - . . . .	30,591	37,345	67,936	911	0 0
Cochin China - . . . .	—	868	868	13	0 0
Muscat - . . . .	—	132,397	132,397	1,306	18 0
Pondicherry - . . . .	—	37,514	37,514	392	8 0
United States - . . . .	1,253,444	—	1,253,444	11,200	0 0
Total - . . . .	147,271,336	34,104,097	181,375,433	1,968,377	19 8

In 1845 the total amount exported was only 45,600 tons.

The only produce and manufactures of the colony besides sugar and rum which were exported during last year, were—

Aloes fibre, 3,169 cwt.  
Cocoa-nut oil, 259,390 gallons.  
Vanilla pods, 13,490 lbs.

Number of estates.

The sugar estates are rather more than 200 in number, and there are upwards of 70,000 Indians settled on them.

Coolies on estates.

The total immigrant population in the colony on the 10th April 1871, was 153,703, 109,173 males and 44,530 females; but by deaths and departures that number was reduced in December 1871 to 151,985.

The average cost of introduction of coolies charged to employers was, in 1871, 9*l.* 15*s.* 10*d.* per male adult from Calcutta, and 11*l.* 5*s.* 6*d.* per male adult from Madras.

On the 10th April 1871, the Indian population on the sugar estates was as follows, according to the census taken on that day :—

	Males.	Females.	Total.
Immigrants :—			
From Calcutta - - -	36,815	12,836	49,651
„ Madras - - -	18,086	9,090	27,176
„ Bombay - - -	5,035	2,143	7,178
Indo-Mauritians - - -	16,192	14,863	31,055
Free Indian passengers - -	40	12	52
Total - - -	76,168	38,944	115,112

Mortality on sugar estates.

The mortality on sugar estates since 1869 has been as follows :—

1869 - - - 3,701 = 30 per 1,000.  
1870 - - - 2,352 = 16 „  
1871 - - - 2,841 = 21 „

The estates of Plaines Wilhems gave the lowest death-rate, and those of Rivière du Rempart the highest—

Plaines Wilhems	-	-	16 per 1,000.
Rivière du Rempart	-	-	25 „

Of the 75,885 men engaged in 1871 within the colony, 47,713 re-engaged themselves to the employers they had already served. Those who changed masters numbered 28,172.

### THE SUGAR CANE.

The cultivation of the sugar cane is peculiarly exposed in Mauritius to injury from hurricanes, as well as from insect plagues, two of which, the “borer” and the “poua pache blanche,” are particularly destructive; the former insect is furnished with a horn like a screw, by means of which it perforates the canes. It was estimated in 1861 that the sugar crop fell short by 20,000 tons of what it would otherwise have been, owing to the destructive agency of this caterpillar.

Cultivation of the sugar cane.

The crop of 1874 fell short, in an equal degree, from the effects of a hurricane, which passed over the island in 1874, whilst the crop of 1875 suffered to a much greater extent from drought.

Fortunately for the interests of the island the crop of 1876 is all that could be desired. The yield is estimated at 135,000 tons, and the average value per ton is not expected to come short of last year.

The sugar canes when ripe are about 12 feet high and 2 inches in diameter. As soon as the plant blossoms the leaves begin to wither and die, and the cane changes its colour. The sugar cane in its different stages was perfectly illustrated in the representations painted from nature in Queensland, New South Wales, and Mauritius which were exhibited at Vienna. The cane having ripened, is cut, tied up in faggots, and conveyed to the mill, where it is crushed by means of cylindrical rollers, the juice falling into large vats placed for its reception beneath.

In no part of the world has the manufacture of raw sugar been brought to a higher state of perfection than in Mauritius. Every improvement, alike in the process as in the necessary machinery, which modern science has brought to light, has been eagerly taken advantage of regardless of expense.

Manufacture of sugar.

The “modus operandi” in the manufacture of sugar is now so generally known that it is needless here to refer to it in detail; suffice it to say, that on almost every estate the vacuum pan system, by which an immense saving in time is effected, is now adopted. When granulation has taken place—the time allowed for which varies according to the size of crystals it is sought to produce, but may be said to be about four hours—the sugar is allowed to run out through wooden troughs into large iron tanks to cool, and afterwards passed through the “turbines” (centrifugal machines), which, revolving at the rate of 1,000 rotations per minute, eliminate all the syrup from the sugar.

During this process water is added in more or less quantity, according to the degree of whiteness which it is desired to obtain. For the last three years, to obtain a more perfect degree of whiteness in the crystallised descriptions of sugar, a system has been pretty generally adopted known as the “procédé Icery,” so called from its owing its origin to the Honorable E. Icery, M.D.

It consists in the use of mono-sulphite of lime for the better purification of the veson (cane juice); the “clairce,” after leaving the battery, being treated by this process previous to passing into the vacuum pan. The syrup as it issues from the turbine is collected in reservoirs, to be again brought back to the vacuum pan, producing sugars known as 1st, 2nd, or 3rd syrups. The residue or molasses is finally appropriated to distilling purposes.

Since the introduction of steam mills and machinery the cultivation of the sugar cane has nearly superseded all other kinds of agriculture. In many places plantations have been rooted up to make room for the more lucrative cane, and in others, where the land from exhaustion has become unproductive, hundreds of acres of the primeval forest have been recklessly cleared away for the same purpose. The interesting meteorological statistics and tables sent to Vienna by Mr. Meldrum of the Royal Observatory, show that although the

Extension of cane cultivation and its results.

Effect on climate.

rainfall for several years past has not been on the whole of much less amount than formerly, it is confined in a great measure to particular localities and the higher parts of the island, instead of being general, thus leaving many districts either entirely without or with an insufficient amount for cane cultivation. Mr. Meldrum calls particular attention to the destruction of the forests as a means of increasing the temperature and decreasing the rainfall. He calculates that at least 70,000 acres, or about one-sixth of the entire area of the island, have been denuded of forest since 1852, and that, too, on the central and elevated parts at or near the sources of the rivers, and in the neighbourhood of swamps and marshes, close to which sugar plantations have been lately commenced. It requires no instrumental observations to show that the climate in the interior of the island is much drier than it was some years ago, and as this state of things is prejudicial to the health of the population as well as to the cultivation of the sugar cane, he recommends, as far as practicable, the restoration of certain portions of the forests of which this once beautiful and salubrious island has been deprived.

#### FIBRES.

##### Fibres.

Many varieties of fibre are produced in Mauritius; those most valuable are the "*Fourcroya gigantea*," and "*Agave americana*," both much used in the manufacture of ropes. The "*Sansevieria cylindrica*," "*Zeylanica*," and "*Latifolia*," are also extremely valuable, and are said to yield the strongest known fibre.

##### "Gomuti" fibre.

The Gomuti, from the trunks of "*Arnaga sacharifera*," is likewise an exceedingly useful fibre, and is much used as a substitute for horsehair in stuffing cushions, &c. The process of manufacture was at the outset of the most primitive character. Leaves of the aloe were cut and steeped in sea water on the shore in holes dug for the purpose. When sufficiently steeped these leaves were beaten with sticks and rubbed with stones to remove all the pulpy matter, the fibrous portions being then again frequently washed and bleached in the sun.

##### Its preparation.

The favourable results obtained from the first trials speedily led to a further development of this industry, which now promises to become important and remunerative. Hitherto the aloe, growing wild in most of the uncultivated parts of the island, has sufficed; but of late those persons who have seriously occupied themselves in the matter have commenced regular plantations, both by transplanting the young plants and also by raising seedlings.

Great improvements have also been effected in the mode of preparation, but there is no doubt that in this respect much yet remains to be done. The more improved method of preparation is by passing the leaves through rollers similar to those used for crushing the sugar cane, with this difference, that the cylinders employed for crushing the leaves of aloe are furnished with teeth, or more correctly speaking scrapers, so that not only is the leaf crushed, but a certain portion of the pulpy refuse at the same time removed. A great saving in time, as also in manual labour, is thus effected. The fibre is then thoroughly cleansed by steeping, and dried and bleached in the sun.

There were also exhibited six sizes of rope made from the aloe fibre; this is a comparatively new industry in Mauritius, but is rapidly developing. The fibre is much esteemed in England and meets with ready sale. The price depends entirely upon the more or less care with which the fibre is prepared, and consequently varies very considerably, say from 20*l.* to 42*l.* per ton. Some which was exceedingly well prepared has lately realised as high a price as 50*l.* per ton. The aloe fibre combines extreme lightness with great strength.

#### WOODS.

##### Timbers.

The specimens of timber, 63 in number, 46 of which were from indigenous trees, are also worthy of more than passing notice.

Those most remarkable are:—

"*Laboureddonasia glauca*," used for house and ship building, cabinet and furniture work. Barks good for tanning and dyeing.

"*Colophonia mauritiana*," a resinous, heavy wood, much used for framing of carts, felloes of wheels, and in some parts of shipbuilding, breaks

for railways, carriages, and waggons. This is a large tree, which often attains a diameter of six feet.

"*Jossinia lucida*," a slow-growing tree. Wood very hard and heavy, much used in building, and named from its extreme hardness.

"*Labourdonnasia revoluta*," good for all building purposes. These several kinds of "*Bois de Nattes*" are not excelled in durability by any other kind of wood.

"*Olea lancea*," an elastic wood, good for shafts, tool handles, &c.

"*Memecylon trinerve*," seldom of large size. The wood is excellent, and much esteemed by carpenters for handles to axes, &c. It is very elastic; diameter 6 to 8 inches.

"*Syzygium*." This tree produces wood of excellent quality, and useful for many purposes.

"*Sideroxylon cinereum*," a tall, straight, and durable tree some five feet in diameter. Used for house-building, planks, shingles, and is almost indestructible if cut in the proper season.

"*Mangifera indica*," often attains a large size. The wood is light but tough, and is used for doors, packing cases, &c. It is scarcely possible to draw nails out of it.

"*Heriteria littoralis*," a large tree, wood excellent, close grained, and dark coloured; makes beautiful furniture.

"*Acacia alata*," said to be stronger than teak. Heart wood excellent, hard, and durable, useful for many purposes, and stands a heavy strain.

There are many other specimens equally deserving of notice if space admitted, but sufficient has been stated to show the value of Mauritius woods, and the various purposes for which they can be used.

#### FRUITS AND SPICES.

The fruits of Mauritius are the mango, banana, custard apple, and avoca, *Fruits.* the guava, letchi, mabolo, and tamarind. The pine apple also grows to perfection. The variety is very great, and the finer kinds are not anywhere surpassed in size, beauty, or flavour.

The principal spice trees in the colony are cloves, and nutmegs.

*Spices.*

Cotton, sago, betel, ginger, pepper, camphor, and vanilla also flourish in Mauritius, and pods of the latter plant are exported in small quantities.

*Other productions.*

The manioc, cassava, and arrowroot are not grown in sufficient quantities to export. They are produced more for home consumption.

#### MADAGASCAR PRODUCE.

In writing of Mauritius one can now-a-days hardly refrain from some allusion to Madagascar, as almost the entire trade with Europe is carried on through Mauritius. Exports from Madagascar are for the present restricted to oxen (for the supply of Mauritius and the neighbouring French colony Reunion), rice, hides, india-rubber, and various gums and fibres. The principal articles of import are, cotton manufactures, salt, rum, hardware, and gunpowder. A large trade both in imports and exports is carried on all round the coast by American traders. Some idea may be formed of the growing importance of the trade with Madagascar by a reference to the following statistics of that with Mauritius.

*Trade between Mauritius and Madagascar.*

#### EXPORTS FROM MAURITIUS TO MADAGASCAR.

	Cotton manufactures.	Rum.
1867 -	- £18,296 -	- £4,660
1868 -	- 24,106 -	- 3,305
1869 -	- 18,080 -	- 1,340
1870 -	- 32,846 -	- 4,620
1871 -	- 50,070 -	- 11,119
1872 -	- 48,990 -	- 20,262
1873 -	- 57,350 -	- 20,419
1874 -	- 64,814 -	- 17,137
1875 -	- 57,350 -	- 20,419

**India-rubber.**

India-rubber is now exported in large quantities both to America and Europe. The following table shows the development of this trade with Mauritius alone :

1867	-	-	-	-	None
1868	-	-	-	-	£ 387
1869	-	-	-	-	282
1870	-	-	-	-	12,932
1871	-	-	-	-	31,310
1872	-	-	-	-	84,252
1873	-	-	-	-	37,459
1874	-	-	-	-	21,452
1875	-	-	-	-	14,540

The rubber being for the most part unskilfully prepared is inferior to Para, and compares rather with that exported from Penang. Its value in the London market at present is from 1s. 4d. to 1s. 9d. per lb. The decline in the quantity imported during the last three years is to be ascribed to the reckless destruction of the Caoutchouc plant.

**Fibres.**

Of the fibres of Madagascar that most appreciated is the raffia fibre, much esteemed in Europe, the present value of which is 65l. to 70l. per ton.

**Silk.**

Silk is produced in Madagascar in some quantity, but has not yet become an article of export. A recent attempt to send cocoons to Europe signally failed, owing to the want of skill with which they had been prepared.

**CONCLUSION.**

From these few statistics it will be seen that Mauritius, a small colony of 432,680 acres, has become, by the energy and enterprise of its inhabitants, one of the most prosperous and important sugar-growing colonies of the British Crown, and that the annual value of that produce is over 2,500,000l.

In view of the injury to which the sugar-crop is so constantly exposed, it is gratifying to observe that within the last few years new industries, although small, in the way of cocoa-nut oil, vanilla pods, timbers and fibres, are gradually coming into notice. Anxiety for the future must invariably be felt by any community so long as it relies solely on a single staple produced mainly by the aid of an alien and ever-changing population.

**OFFICIAL CATALOGUE OF OBJECTS exhibited by the COLONY of MAURITIUS  
at the INTERNATIONAL EXHIBITION of 1876 of PHILADELPHIA.**

*P signifies Award for Exhibit.*

(The Government of Mauritius received an award for Collective Exhibit.)

*Flore Mauricienne.*

24 bottles preserved fruits, &c.

*Mauritius Botanical Gardens.—J. Horne, Esq.*

*Mauritian Woods.*

Syzygium glomeratum.	Calophyllum spurium.
Bois de Pomme.	Takamaka petite feuille.
Cupania laevis.	Labourdonnaia glauca.
Bois Sagaye.	Bois de Natte grande feuille.
Boutonia Mascariensis.	Sideroxylon cinerum.
Acacia Lebbeck.	Moaglier.
Bois Noir.	Mimusops Erythroxylon.
Labourdonnaia revoluta.	Makak, Bois de Natte.
Bois de Natte.	Sideroxylon Bontanianum.
Monimia ovalifolia.	Tambalacoque.
Olea lancea.	Prockia theaeformis.
Olivier Sauvage, Bois Cabris, Bois	Fandaman, Bois Goyave.
Cerfs, &c.	Tambourissa amplifolia.
Tambourissa quadrifida.	Bois Tambour, Pomme Jacot, Pot
Bois Tambour.	de Chambre Jacots.

Diospyros melanida.  
Bois d'Ebène marbré.  
Calophyllum Spa.  
Takamaka blanc.  
Erythrospermum verticillatum.  
Bois gros coco.  
Calicadapne species.  
Bois de Cannelle.  
Nuxia verticillata.  
Bois Maigre.  
Fropiera Mauritiana.  
Bois Bigaïgnon.  
?  
Bois Banane.  
Colophania Mauritiana.  
Bois de Colophane.  
?  
Bois Lallo.  
Syzygium species.  
Bois de Pomme grande feuille.

Calophyllum spectabilis.  
Bois de Takamaka, ou Takamaka  
grande feuille.  
Quisivia oppositifolia.  
Bois Café.  
Tabernaemontana Mauritiana.  
Bois de lait à fleurs jaunâtres.  
Hernandia ovigera.  
Bois Blanc.  
Myrtaceae Sps.  
Bois de fer.  
Erythroxyton laurifolium.  
Bois de Ronde.  
Anthrhea verticillata.  
Bois Lousteau.  
Elæodendron orientale.  
Terminalia catappa.

*H. Lemièrre, Esq.*

Salt. One sample.

*Messrs. H. and E. Bouton.*

One sample of Mauritius Coffee.

*Flore Mauricienne.*

One sample of Vanilla.

*L. Bouton, Esq.*

3 Copies of a book on the Medicinal Plants of Mauritius, with  
50 Specimens of these Medicinal Plants.

8 Copies Transactions of the Royal Society of Arts and Sciences of Mauritius,  
from 1870 to 1875.

*Mauritius Botanical Gardens. - J. Horne, Esq.*

*List of Fibres.*

Dracaena species.  
Cordia mixta.  
Hibiscus liliflorus.  
Pandanus utilis.  
Alpinia magnifica.  
Sansevieria zebrina.  
Livistona Mauritiana.  
Agave Americana.  
Theobroma cacao.  
Musa species.  
Rapolocarpus lucidus.  
Dracæna Mauritiana.  
Strelitzia regina.  
Pterospermum acerifolium.  
Ficus sp.  
Ficus sp.  
Musa textilis.  
Latania aurea.  
Sansevieria Zeylanica.  
Ficus sp.  
Musa paradisiaca.  
Sagrus Ruffa.  
Colocasia antiquorum.  
Agave Americana variegata.

Sida glutinosa.  
Musa violacea.  
Agave Mexicana.  
Boehmeria nivea.  
Heliconia gigantea.  
Sansevieria latifolia.  
Sansevieria cylindrica.  
Urania (Ravenala) Madagascariensis.  
Carludovica palmata.  
Sterculia species.  
Hibiscus sp.  
Guazuma ulmifolia.  
Fourcroya gigantea.  
Square fruited Banana.  
Ficus species.  
Ixora corylifolia.  
Melochia liliacefolia.  
Musa var (Otaheite).  
Paritium tiliaceum.  
Caladium species.  
Morus tartarica.  
Caladium purpurescens.  
Malvaviscus arboreus.  
Sagrus saccharifera.

for Collective Exhibit of vegetable fibres,

6 Walking sticks.  
2 Bottles Nutmegs.  
1 Parcel red bark (Cinchona succirubra).

*Messrs. L. De Brugada and E. De Boucherville.*

2 Specimens of Ramie fibre—Boehmeria nivea.

## 15 Samples of Sugar sent by J. A. Wiché, Esq.

for Collective Exhibit of sugar.

- "Rose Bell," Ceylon Company, Limited.—White Vesou Sugar, manufactured for Bombay and Australian markets.
- "Astroea," Ceylon Company, Limited.—White Vesou, manufactured for Bombay and Australian markets.
- "Astroea," Ceylon Company, Limited.—White Syrup Sugar, for Bombay and Australian markets.
- "Medine," Mrs. Widow Kœnig.—Fine White Syrup, manufactured for Australian market.
- "Medine," Mrs. Widow Kœnig.—Fine White Vesou, manufactured for Australian market.
- "Constance," Heirs. Pellegrin.—Fine White Crystallized, for Bombay and Australian markets.
- "Constance," Messrs. Manès & Co.—Finest White Sugar, for Australian market.
- "Constance," Messrs. Manès & Co.—Fine White Syrup, for Australian market.
- "Plaisance," Messrs. Hart and de Bissy.—Brewers Crystal, manufactured for Australian market.
- "Plaisance," Messrs. Hart and de Bissy.—Fine Brewers Crystal, manufactured for Australian market.
- "Sebastopol," Mr. E. Montocchio.—Raw Sugar, fine crystallised, for European market.
- "Hewetson," Mr. W. Hewetson.—Raw Sugar, fine crystallised, manufactured for European market.
- "Chamouny," Mr. N. Tourrette.—Raw Sugar, refining quality for European markets.
- "Walhalla," Mr. C. de Lanux.—Yellow grocery for Australian market.
- "Mon Repos," Mr. Nozaic.—Yellow Sugar for Australian market.

*Mr. François Marie,*

Sample of Arrowroot.

*Mme. Vve. Foucaud.*Articles made from Palmiste (*Oreodoxa Regia*) leaves.

Slippers.  
Cigar case.  
Small baskets.

Large basket.  
Napkin rings.

*J. B. Kyshe, Esq.*

Two copies Mauritius Almanack, 1874 and 1875.

*Mr. S. Moco.*

40 Photograph views of Mauritius landscapes.

36 Ditto types of the Chinese, Indian, Malagash, and Mozambique inhabitants of Mauritius.

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**THE SEYCHELLES ISLANDS.**

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**THE PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**Manager at the Seychelles Islands of Collection,  
C. S. SALMON, ESQ., Chief Commissioner.**

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**Superintended at Philadelphia by the BRITISH EXECUTIVE  
COMMISSIONERS.**

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**Agents, MESSRS PETER WRIGHT and SONS, 307, Walnut  
Street, Philadelphia.**

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## SEYCHELLES ISLANDS.

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### REPORT on the SEYCHELLES ISLANDS by CHIEF CIVIL COMMISSIONER SALMON.

Port Victoria, Mahé,  
1st December 1876.

The Seychelles Archipelago contains 34 islands that lie within 3° 43' and 4° 48' latitude south, and 55° 16' and 55° 28' longitude east; twenty-four of them are inhabited and partially cultivated, nine can only be used as fishing stations, one is used as a wharf and coal depôt and for careening purposes in the harbour of Port Victoria. Position.

The total acreage of the 24 habitable islands is about 57,000 acres, including rocky promontories. Of this it is computed that 26,140 acres are in forest, shrub, or lying waste, but mostly capable of cultivation, 5,500 acres are either barren rocks or only able to support dwarf trees and creeping plants, 22,000 acres are covered with cocoa nut plantations more or less well laid out, 939 acres are under coffee, cloves, cotton, vanilla, cacao, sugar cane, and tobacco, and 2,421 acres are growing root and other crops for the food of the people or are being prepared for that purpose. The waste land is to some extent used as pasturage, and also the cocoa nut plantations when in marshy soil with grass, but only in a few instances. Acreage.

The smaller islands, except Cow Island and Denis Island to the extreme north, and Flat Island to the extreme south of the Archipelago, are, hilly, the larger islands are all mountainous, the highlands varying from 800 to 2,700 feet above the sea. Except a few of the very smallest all have water, generally in abundance and well distributed. The largest island measures 30,000 acres, the second largest about 12,000 acres, and the others vary down to 40 acres.

The extreme variation of temperature in the shade is from 68° to 86° Fahrenheit, the former is met only in the highlands during the S.W. monsoon from sunset to sunrise, and occasionally and momentarily it may be less during those hours. The average temperature on the coast all the year round is 77° in the night and early morning together, 79° in the evening after sunset to 9 P.M., and 83° during the day from 7 A.M. to 6 P.M. The thermometer in the shade with no refraction never rises above 86° except occasionally and momentarily. There is generally a breeze night and day blowing strongly from the S.W. for one half the year, and lightly from the N.W. and N.E. for the other half. The rains are distributed over all the seasons, but the rainfall is more general and heavier during the light winds from the northern variations, and while the warmer temperature prevails. The climate is healthy. There are no fevers or diseases except what may be said to be due to excessive imprudence in diet. Exposure, when the body and head are clothed and covered, produces no ill effects. Climate.

The ascertained population of the Archipelago this year is about 12,900 (men, women, and children). It has increased 15 per cent in five years. About 5 per cent. of this is due to liberated Africans, children born to them since their introduction, and immigrants. The principal island has a population of 10,100. Population.

There are two first class harbours: one, Port Victoria, Mahé, and the other Curieuse Bay, about 30 miles north of it, between the Islands of Praslin and Curieuse. They are both perfectly safe in all weathers and easy of access, and provisions and good water are abundant. Coal may be purchased at Port Victoria, and 50 to 75 tons a day put on board; this latter port is in process of being lighted, to enable a vessel to enter and anchor in either the outer or inner harbour during the dark. Harbours.

**Means of communication.**

The average time for a sailing vessel to take to arrive from England or Marseilles is 90 to 100 days.

**Postal arrangements.**

The postal and steam communication is once a month, via Aden and Suez Canal, by the French mail line.

**Imports.**

The value of imports this year comes to about 35,000*l.* The cotton goods, wearing apparel, and articles of dress (of the value of between 6,000*l.* and 7,000*l.*) are mostly of English manufacture, and generally come indirectly from Mauritius or Marseilles, but principally from the latter port by steamer. 1,000 tons of coal were from Cardiff direct. The bulk of the remaining imports are made up of rice, wines and spirits, provisions, hardware and ironware, imported from Mauritius, Réunion, Nosbé, Madagascar, France, England, and America. Machinery of the value of 4,400*l.* was imported through Marseilles.

**Exports.**

The exports this year will amount to about 36,400*l.*, exclusive of cocoa nut fibre, of which 75 tons a month are manufactured, of excellent quality, and of the value of 20*l.* a ton. 29,500*l.* represent about the value this year of cocoa nut oil and cocoa nuts exported, 3,660*l.* the value of tortoise shell, and 3,240*l.* the value of 23 miscellaneous articles of produce, raw and prepared. All the manufactured fibre is shipped to London. The tortoise shell is principally shipped to France. Three quarters of the cocoa nut oil, and nearly all the nuts are shipped to Mauritius, as well as the majority of miscellaneous articles of produce, the remainder goes to Marseilles by mail steamer. The trade with Europe is increasing, and that with the parent colony Mauritius, is relatively less every year.

**Whaling.**

An important whaling trade is carried on by vessels from New Bedford, United States. This year there are about 15 cruising off the Seychelles Islands; they also visit the Arabian Gulf and the Comora islands. Their principal fishing ground, however, is the deep sea on the edge of the Seychelles Bank.

**Manufactures.**

There is one cocoa nut fibre factory in Seychelles, established in 1874 at Port Victoria. It now turns out about 75 tons of fibre a month, of excellent quality. The value is about 20*l.* a ton, giving a gross yield of 1,500*l.* a month, or 18,000*l.* a year. When all the cocoa nut trees now planted are in bearing there will be sufficient husks to support three factories, turning out between them from 50,000*l.* to 60,000*l.* of fibre a year.

**Natural productions.  
Cocoa nuts and palm.  
Cultivation.**

The principal growth is the cocoa nut tree. The number of trees planted is computed to be 1,320,000, or 60 trees to an acre; this is the average on the ground. Formerly, as many as 75 were planted, but now it is found that 45 trees to an acre of land of average quality pay best, both in rapidity and abundance of yield. The time between planting and maturity varies from 7 to 12 years, according to soil, situation, and method of planting. There are plantations that will never yield but sparingly, from being badly laid out, or from the ground being unsuitable. 100 trees in bearing average 5,475 nuts a year, and 80 nuts give one velt of oil. An acre of land under cocoa nuts in full bearing gives a gross return of between 7*l.* and 8*l.* a year in expressed oil. This is equal to 5*l.* a year net profit. The advantage of the cocoa nut is that it requires comparatively no labour or oversight, and the capital once sunk has only to be waited upon for a certain return. Its culture is undoubtedly now preferred to that of other things requiring more labour and capital and greater energy and assiduity, although, from the nature of the climate and the soil, the returns from the latter would be infinitely greater and quite as certain. The oil is crushed from the nuts in the large estates. The process is primitive: the trunk of a tree is hollowed out as a mortar, and in this is worked a large wooden pestle, by means of a shaft 12 feet long fixed to its top, the other end of the shaft is weighted by pieces of iron or by stones, a donkey or two or a bullock is attached to it to work it. The movement is rotatory and uniform. Into the mortar the fruit of the cocoa nut, previously dried in the sun, is placed in pieces, and by the rotatory movement of the pestle these are crushed between it and the side of the mortar. A tap at the bottom of the mortar lets out the oil. The residue, after the oil is expressed, is used for cattle food and to feed poultry. A modern press would extract at least 12 to 15 per cent. more oil, but the stuff remaining would probably be of no value for cattle food until prepared with condiments.

**Mode of extracting the oil.**

Large quantities of cocoa nuts, estimated at 6,000 a day, are consumed by the people as food. The following tables give a résumé of the present and prospective yield, with the values.

*Home Consumption.*

	Velts.	Nuts.	Trees.
Oil consumed	27,400	2,190,000	40,000
Nuts „	26,000	2,080,000	38,000
	<u>53,400</u>	<u>4,270,000</u>	<u>78,000</u>

*Exportation.*

	Velts.	Nuts.	Trees.
Oil exported	140,000	11,200,000	206,000
Nuts „	12,500	1,000,000	18,200
	<u>152,500</u>	<u>12,200,000</u>	<u>224,600</u>

*Total Production.*

	Velts.	Nuts.	Trees.
Exportation	152,500	12,200,000	224,600
Home Consumption	53,400	4,270,000	78,000
Total actual yield	<u>205,900</u>	<u>16,470,000</u>	<u>302,600</u>
5 per cent. loss on trees bearing, from blight and other causes	10,295	823,500	15,130
Total possible yield of trees now in bearing	<u>216,195</u>	<u>17,293,500</u>	<u>317,730</u>

*Trees planted, not yet bearing.*

1,002,270 Trees.

151,840 - Deduct 15 per cent. for over planting, &c.

850,449

42,525 - Deduct 5 per cent. loss on trees bearing, from blight and other causes.

807,924 Trees = 44,233,839 Nuts = 552,923 Velts of Oil.

The full value of the velt of oil is 4s. The actual value of the cocoa nut plantations now yielding is 40,000*l.* a year. The value of those planted, but not yet yielding, will be hereafter 110,584*l.* a year more. The full value has been given to the velts of oil, as the husk of the nut, for which there is a market at the Fibre Factory, has not been taken into account. The yearly value of the cocoa nut plantations of Seychelles, 8 years hence, should be 150,000*l.*

Cotton was formerly grown in these islands, and the quality was considered good. Various reasons, principally the want of labour, caused this cultivation to be abandoned, except at Denis Island. Much of the ground formerly under cotton is now lying waste.

Sugar-cane is only grown at Seychelles for distilling purposes. The industry is hardly a paying one. The same labour and capital would yield more returns if expended in coffee, cocoa, and tobacco. The climate and soil of the Seychelles islands are not so well suited for the sugar-cane as for the tropical produce above mentioned. There are at present two small distilleries at work, one at Fregate island and one at Mahé island. They produced between them, in 1875, 9,500 gallons of rum.

## Tobacco.

Seychelles has been long noted at the neighbouring English and French colonies of Mauritius and Réunion for the quality of its tobacco. The pure leaf is pronounced strong but of good flavour by pipe smokers.

The cultivation has been latterly increasing. The lowland hills and soil are well adapted to the growth of this produce. There is no exportation beyond small parcels for the above colonies. The mode of preparation is suitable only for local purposes and speedy consumption.

## Coffee.

Plantations of coffee were commenced systematically about four years ago, and promise to bear well. The mountain slopes and ravines are well adapted to this culture, but not more than 300 acres are planted as yet. The plant bears fruit in four years at Seychelles. In former years—probably before the abolition of slavery—this plant seems to have been rather extensively cultivated, to judge from the remnants of plantations scattered about the hills.

## Cacao.

No tropical produce comes on so rapidly, or yields more largely, at Seychelles, as the cacao (*Theobroma cacao*). The market value of this article, and the manner of its preparation, as in the case of other valuable plants, were evidently unknown to the cultivators, which mostly accounts for the slight attention paid to it heretofore. It is now attracting much attention, and 100 acres are planted with it.

## Cloves.

Clove trees grow well. As a rule do not bear regularly every year, the failure to do so is said to be due to the wasteful method of cutting the branches to get at the fruit. Extensive plantations of this tree have been cut down to make timber and firewood. It is again being replanted, owing to the latterly increased value of cloves. The vanilla plant, coffee, and cacao grow well in its shade.

## Cinnamon.

Cinnamon (*Cinnamomum quassia*) as a tree and shrub is common in the lowlands of Mahé, but is made no use of.

Nutmeg, spice,  
pepper.

The nutmeg tree and all spice grow well, but are only a late introduction, in small quantities. Pepper (*piper nigrum*) grows abundantly as if it were indigenous, but it is not cultivated by the people.

## Vanilla.

Vanilla is attracting much attention, and is being carefully and systematically cultivated by several growers; a parcel recently shipped to Europe averaged 75 pods to the pound weight of the first quality, the average for 1st, 2nd, and 3rd qualities gave 103 pods to the pound weight. The aroma and colour were perfect. The plants begin to bear in the fourth year. There is a species of vanilla indigenous to Seychelles to be met with abundantly. The *Vanilla aromatica* grows with equal facility, and bears well if kept free of weeds and looked after. There are about 100 acres under this cultivation; the majority of the vines have been planted quite recently; about 500 pounds weight only of capsules will be exported this year, nearly all for Europe. The value varies according to the quality; it ranges from 30s. up to 60s. the pound weight.

Coco de Mer  
tree.

The most noted production of these Islands is the Coco de Mer palm (*Liodocsea sechellarum*) now confined to a few spots at Praslin Island, and a few acres of land at Curieuse Island. The tree has been often described. The young leaves are prepared to resemble straw, and this is worked up as hats, baskets, and various ornamental articles that are much sought after. The nuts are worth, on the spot, from one shilling to three shillings each, according to size and shape. Some of the trees at Praslin are 90 feet high; they grow perfectly straight. There is one of these trees at Government House grounds, planted 37 years ago. The trunk is only appearing to show above ground; it has 26 leaves, the stalk of each is about 10 feet long and 16 inches in circumference, the leaf itself being 10 feet long by 8 feet wide. In the Praslin valleys these dimensions would be much exceeded. There is no certainty as to how long the tree takes to bear fruit to maturity. The one above described has young fruit that were duly fertilised, but they fall off. The time required is probably over 40 years. It is said the nut takes five to seven years to grow to its full size.

Palms and  
fibrous plants.  
Destruction of  
timber.

There are several valuable palm trees peculiar to these Islands, and many kinds of fibrous plants are plentiful. The timber has been so much cut, and fires have damaged so many forests, that there remains barely enough to supply local wants.

The Fisheries supply sufficient dried fish for local purposes and a slight Fisheries. export. There is room here for much development. The hawksbill turtle (for tortoise shell) and the edible turtle are found in these waters, but yearly in reduced numbers. Considerable quantities of the latter are yet found among the Admirantee Islands and the Islands to the westward of the Seychelles bank.

The Admirantee Islands, 20 in number, lying between 4° 51' and 7° 20' south latitude, and 52° 47' and 53° 66' east longitude, have at present about 130 people engaged on them, planting and fishing. The people are all hired at Mahé, about two thirds of them within the last five years. These Islands come under the jurisdiction of Seychelles. The more valuable of them have been sold to private individuals, but the fishing stations are generally government property, and some are rented. The Islands are all flat. Two of them, comprising about 1,900 acres, are under cocoa nuts, half of which are in bearing and half recently planted. Three islands, comprising about 2,100 acres, are planted generally with Indian corn. Four of the uncultivable islands are known as excellent fishing stations. The remainder are very small, mere patches of rock and sand. Admirantee Islands.

The government of the Seychelles Archipelago and its Dependencies is Government. itself subordinate to the government of Mauritius. The settlement is wholly self-supporting. It has a council, with financial and other legislative powers, of a purely local character, composed of five unofficial and three official members.

The French Civil Code is the law in civil matters, while the English law Laws. obtains generally in criminal matters. Local ordinances can deal with matters not repugnant to the above.

The revenue for 1875 was 13,323*l.* 16*s.* 9½*d.*, received under 26 heads, Revenue and and the expenditure amounted to 12,614*l.* 15*s.* 11½*d.* There is no debt. expenditure. There is an average balance in the treasury equal to two months receipts.

The expenses of the various departments of Government in 1875 were:—

	£	s.	d.
Ecclesiastical and educational	-	-	975 0 0
Roads, buildings, &c.	-	-	3,048 0 0
Police, justice, and gaols	-	-	3,662 0 0
Medical service and hospitals	-	-	1,193 0 0
Post office, port, &c.	-	-	1,100 0 0
Administrative, revenue, and immigration departments, pensions, custodians of crown lands, and markets, refunds, stationery, printing, and sundries	-	-	2,636 15 11½

The Government of Mauritius received an award for collective exhibit, which included the contributions from Seychelles.

#### OFFICIAL CATALOGUE OF OBJECTS FROM SEYCHELLES exhibited at the PHILADELPHIA EXHIBITION OF 1876.

##### *The Chief Commissioner of Seychelles.*

- 67 Varieties of Seychelles woods, in vertical sections of 6 inches each.  
7 Samples, planks of superior kinds of woods.

##### *Mr. Briard of Praslin Island.*

Coco de Mer Nuts—polished.  
Coco de Mer Nuts—rough.  
Coco-nut, large size.

##### *Mr. J. Ames Bury.*

Coco de Mer wood walking stick.	Plum stick.
Cocoa-nut wood stick.	Fancy Hardwood stick, and
Hardwood sticks.	fancy sticks.

*Mr. Briard.*

Samples of Bark dye black (Bois de Pomme) and of stuff dyed from same.

*Mr. Sylvain Houareau.*

Roll of Seychelles tobacco.

• *Mr. Madine.*

Parcel of cigars made from Seychelles tobacco.

*Mr. Lemarchand.*

Samples of Cacao, Cloves, Coffee, and Vanilla.

*Messrs. Brooks & Dupuy.*

Sample Cotton from Denis Island.

*Mr. Briard.*

Sample of Cotton.

*Mr. F. Cheyron.*

12 Pieces of Hawksbill Turtle Shell.

Young Hawksbill Turtle Shell (whole).

*Mr. Cauvin's Distillery.*

Sample bottle Seychelles white Rum.

*Mr. Nageon, of La Digue Island.*

Sample bottle of Cocoa-nut oil.

*Miss Bouquet.*

Baskets fancy Coco de Mer (*Lodoicea Seychellarum*) straw.

Hats " " " " " " for girls.

" " " " " " for men.

Fancy basket—miniature.

Bundle, and baskets Coco de Mer (*Lodoicea Seychellarum*) straw.

Nest of Baskets containing 1 dozen.

Pair slippers.

Cigar cases.

Pair watch pockets.

Cups and saucers.

Fans, various patterns.

Samples Coco de Mer straw—plaited.

" " " rough.

*Mr. Thomy Cayol.*

Bouquets of shell flowers.

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**STRAITS SETTLEMENTS.**

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**THE PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**Superintended at Philadelphia by the BRITISH EXECUTIVE  
COMMISSIONERS.**

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## STRAITS SETTLEMENTS.

The Straits Settlements consist of the islands of Singapore and Penang, near the peninsula of Malacca, with small strips of land on the west coast of the mainland, the whole lying between the first and sixth degrees of north latitude. Position.

### SINGAPORE.

*Singapore* is an island about 25 miles long by 14 wide, situated at the southern extremity of the Malayan peninsula, from which it is separated by a narrow strait about  $\frac{1}{2}$  of a mile in width. There are a number of small islands adjacent to it which form part of the settlement. Singapore.  
Position and  
extent.

The seat of Government is the town of Singapore, at the southern point of the island, in lat.  $1^{\circ} 16' N.$  and long.  $103^{\circ} 53' E.$  Town of  
Singapore.

This island was taken possession of by Sir Stamford Raffles in 1819 by virtue of a treaty with the Malayan princes. It was at first subordinate to Bencoolen, in Sumatra, but in 1823 was placed under the Government of Bengal. It was afterwards incorporated with Penang and Malacca, and placed under the Governor and Council of the incorporated Settlement. History.

### PENANG.

*Penang*, or Prince of Wales's Island, as it is officially called, is about 20 miles long and 9 broad, containing an area of 107 square miles, situated off the west coast of the Malayan peninsula in  $5^{\circ} N.$  lat., and at the northern extremity or entrance to the Straits of Malacca. On the opposite shore of the mainland, from which the island is separated by a strait from 2 to 10 miles broad, is Province Wellesley, a strip of territory forming part of the settlement, averaging 8 miles in width, and extending 45 miles along the coast, including 10 miles of newly acquired territory to the south of the Krian. Penang, or Prince  
of Wales's  
Island.  
Position and  
area.

The chief town is George Town, in  $5^{\circ} 24' N.$  lat. and  $100^{\circ} 21' E.$  long.

This was the first British settlement on the Malayan peninsula, having been ceded by the Rajah of Kedah in 1785 in consideration of the payment of an annual sum of 10,000 dollars as long as the British occupy the island. The strip of land called Province Wellesley was acquired from the Rajah in 1798 in consequence of the prevalence of piracy on the shores of the mainland opposite Penang. This province is in a high state of cultivation when compared with the neighbouring territories. In 1806 Penang was made a separate presidency under the East India Company of equal rank with Bombay and Madras. In 1826 Singapore and Malacca were incorporated with it under one Government, of which Penang was the seat. In 1832 the seat of Government was transferred to Singapore. History.

### MALACCA.

*Malacca* is situated on the western coast of the peninsula between Singapore and Penang, about 120 miles from the former and 240 from the latter, and consists of a strip of territory about 42 miles in length, and from 8 to  $24\frac{1}{2}$  miles in breadth. The principal town, called Malacca, is  $2^{\circ} 10' N.$  lat. and  $102^{\circ} 14' E.$  long. Malacca  
Position and  
area.

Malacca is one of the oldest European settlements in the East, having been taken possession of by the Portuguese under Albuquerque in 1511, and held by them till 1641, when the Dutch, after frequent attempts, were successful in driving out the Portuguese. The settlement remained under the Government of the Dutch till 1795, when it was taken possession of by the English, and held by them till 1818, at which date it was restored to the Dutch, and finally fell into our hands in pursuance of the treaty with Holland, the

40609.

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17th March 1824, in exchange for the East India Company's settlement at Bencoolen, on the west coast of Sumatra. By that treaty it was arranged that the Dutch should not again meddle with affairs or have any settlement on the Malayan peninsula, the British Government agreeing at the same time to leave Sumatra to the Dutch.

Appointment of British residents at native courts.

Owing to the anarchy prevailing in some states of the Malay peninsula, and especially in Perak, which has long been a source of disquiet to the community of the settlements, and a hindrance to the prosperity of British traders, endeavours were made in 1874 to provide a remedy by stationing British residents in Perak and Selengore, and in the small state of Sungei Ujong, to advise their rulers in regard to the collection of revenue and general administration. A strip of land was also acquired south of Province Wellesley, about 10 miles broad, beyond the Krian river, as well as a small territory on the mainland opposite the island of Pulo Dinding; to enable the British authorities to keep order in that part of the peninsula. Disturbances broke out in 1875 in the states in question, and Mr. Birch, the British Resident in Perak, was murdered, but energetic measures being taken to quell the outbreaks, they were speedily suppressed and the principal delinquents brought to justice.

Acquisition of territory on mainland.

Disturbances in native states.

Their suppression. Government.

The Government is administered by a Governor, assisted by an Executive and a Legislative Council; the latter body consisting of 11 official members and 6 unofficial nominated members.

Population.

How made up.

In Penang and Province Wellesley the Malay race predominates. The Chinese rank next, and constitute about one-fourth of the whole population, the remainder being made up of Europeans and their descendants, natives of the Madras and Coromandel coasts (called Chuliahs and Klings), Burmese, Siamese, and Bengalees. In Malacca the Malays form a still larger proportion of the population, their numbers amounting to more than three-fourths of the whole. Here also the Chinese are found in great numbers, forming about a sixth of the inhabitants; Europeans and their descendants, native-born Portuguese, natives of India and Arabs, making up the rest. The population of Singapore is more varied in its composition, the Chinese being far the most numerous section of the inhabitants.

Census of 1871.

The census of 1871 gives the following results:—

Singapore	-	-	97,131
Penang and Province Wellesley	-	-	133,064
Malacca	-	-	77,756
Total	-	-	307,951

Statistics of census.

The following are the chief statistics of the census:—

	Europeans.	Malays.	Chinese.	Natives of India.
Singapore	904	19,250	54,120	13,300
Penang	513	20,110	22,720	7,100
Province Wellesley	96	51,100	14,000	10,000
Malacca	47	57,474	13,466	3,000
Totals	1,560	147,934	104,296	33,400

Returns of Chinese unreliable.

These numbers are not considered to be reliable as regards the Chinese population, as they are unwilling to give correct returns, fearing that a poll tax would follow the census. It is estimated that the numbers given might be increased by 20 per cent., which would give a close approximation to the actual Chinese population.

Increase since 1866.

The entire population in 1866 was 273,000, showing an increase in five years, according to the published returns, of 34,951, or nearly 13 per cent.

Vegetable productions.

The principal vegetable productions are gambier and pepper in Singapore; tapioca, chiefly in Malacca and Province Wellesley; rice in Province Wellesley and Malacca; sugar and cocoa-nuts in Province Wellesley. An attempt has also been made in the province, with partial success, to cultivate the tea plant.

Trade.

When Malacca was taken possession of by the Portuguese in 1511 it was one of the grand *entrepôts* for the commerce of the East, but as the Portuguese pushed their operations eastward in the Archipelago and neighbouring

countries the trade of Malacca gradually declined till the establishment of Penang in 1786, when it almost ceased. It has since been a place of no commercial importance, but possessing great undeveloped agricultural resources. Penang in its turn declined in importance after Singapore was established, as the greater part of the extensive eastern trade centred in the new settlement, and Penang came to depend chiefly on the local trade, which has largely increased in consequence of the opening out of extensive tin mines in Laroot, Salengore, and some places on the coast of Sumatra.

The Straits ports are wholly free from duties on imports or exports, nor are tonnage dues levied for general purposes. The only tax to which shipping entering the port is liable consists of a very moderate one of about 1½d. per register ton for the maintenance of certain lighthouses necessary for the safe navigation of the Straits.

The chief exports are tin, which, as already mentioned, is found in large quantities on the Malay peninsula and in the island of Sumatra, sugar, pepper, nutmegs, mace, sago, tapioca, rice, buffalo hides and horns, rattans, gutta-percha, india-rubber, gambier, gum, coffee, dye stuffs, tobacco, &c. Most of these articles are from countries outside the British possessions, the chief productions of which have been enumerated above.

The following table affords a comparison between the united exports and imports in the three settlements in the years 1859-60 and 1875:—

	1859-60.	1875.
	£	£
Singapore - -	10,371,300	18,142,559
Penang - -	3,530,000	7,518,889
Malacca - -	920,000	1,033,539
<b>Totals</b> - -	<b>14,821,300</b>	<b>26,694,687</b>

There has been also a steady increase in the number and tonnage of the vessels which have arrived at the settlements during the three years ending 1875, as may be seen by a comparison of the following figures:—

No. of Vessels arrived.

1873 - -	-	1,675,984
1874 - -	8,761	1,853,507
1875 - -	10,473	2,204,875

The sources of revenue are the same in all the settlements. They consist chiefly of a stamp duty, of the monopolies of preparing and retailing opium for smoking, and of the sale of spirits and other exciseable articles, which are farmed out to private individuals. The land revenue, derived from sales of public lands, quit-rents, tenths, and fees on transfer, with judicial fines and fees, the post office, light dues, and a few miscellaneous items, make up the remaining sources from which revenue is obtained.

The following is a statement of revenue and expenditure for the years 1868, 1874, and 1875:—

	Revenue.	Expenditure.
	£	£
1868 - - -	276,642	254,391
1874 - - -	309,991	317,726
1875 - - -	327,006	319,545

There is regular weekly communication between the Straits Settlements, England and Ceylon by the mail steamers of the Messageries Maritimes Company from Singapore via Marseilles, average duration of voyage 30 days, and by the Peninsula and Oriental Company's steamers from Penang via Brindisi, duration of voyage 29 days. Also with Batavia by the steamers of the Messageries Maritimes and Netherlands India Steam Navigation Company, time about three days, and with Hong Kong by the Peninsula and Oriental Messageries Maritimes mail steamers from Singapore, time six to nine days,

Calcutta.

according to the monsoon. Calcutta may be reached in about six days from Penang by the opium steamers, sailing once a month, and in about 13 days by the fortnightly contract steamers of the British India Company, which sail fortnightly from the same place and touch at Rangoon and other ports.

Australia.

There are also two distinct services to Australia, viz., by the steamers of the Eastern and Australian Steam Navigation Company to Brisbane (20 days) and Sydney via Torres Straits; by Peninsula and Oriental steamers to Melbourne via Gallé, time 27 to 30 days. These are both monthly services.

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*The above account of the Straits Settlements is mainly taken from the Colonial Office List for 1877.*

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**P signifies Award for Exhibit.**

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#### MANUFACTURES, ART, AGRICULTURE.

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##### SILK AND SILK FABRICS.

Meyer, Behn, & Co., Singapore.

- a. Silk floss from Rungpore.
- b. Dyed silk from Rungpore.
- c. Silk thread from Bengal, Gyah, and Rungpore.
- d. Silk lace from Jubbulpore.

##### PHOTOGRAPHY.

Meyer, Behn, & Co., Singapore.—Photographic views.

##### ARBORICULTURE AND FOREST PRODUCTS.

Meyer, Behn, & Co., Singapore.

- a. Woods from Singapore, Madras, Bombay, and Nagpore.
- b. Dye-woods, galls, bark, &c.
- P c. Gutta-percha.

##### POMOLOGY.

Meyer, Behn, & Co., Singapore.—Nuts.

##### AGRICULTURAL PRODUCTS.

Meyer, Behn, & Co., Singapore.

- a. Grass.
- b. Tea, coffee, spices, &c.
- c. Seeds.

##### TEXTILE SUBSTANCES OF VEGETABLE OR ANIMAL ORIGIN.

Meyer, Behn, & Co., Singapore.

- a. Cotton boll, seed, and flake.
  - b. Hemp and fibres.
  - c. Wool.
  - d. Cocoon silk.
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**TRINIDAD.**

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**PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.**

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**Manager at Trinidad of the Collection, SYLVESTER  
DEVENISH, Esq., Surveyor General of the Colony.**

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**Superintended at Philadelphia by the BRITISH  
EXECUTIVE COMMISSIONERS.**

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**Agents, Messrs. PETER WRIGHT & SONS, 307, Walnut  
Street, Philadelphia.**

**REPORT on the ISLAND of TRINIDAD, W.I., principally in connection with the Colony's contribution to some of the Industrial Exhibitions held in Europe and elsewhere (by Sylvester Devenish, Surveyor General of the Colony).**

The object of this very brief and incomplete notice is not to enter into any of the details, descriptive and statistical, which alone could convey a fair knowledge of this interesting Colony. Preliminary remarks.

It is simply, after a very short outline of its geographical features and commercial progress, to relate in a most succinct manner, the part it has taken in some of the Industrial Exhibitions held abroad, as well as to give a cursory glance of its own local shows.

For any information relating to its crops, commerce, Indian immigration (it has been called "*the paradise of coolies*") and other material items of its growing importance, reference can best be made to the interesting report of Mr. Wm. Robinson (now Governor of the Bahamas), on the British Colonies represented at the Vienna Exhibition of 1873, and to Mr. Guppy's very complete and valuable "Trinidad Official and Commercial Register and "Almanack for the year 1877" just published by Asher & Co., London.

The Island of Trinidad, discovered by Columbus on his third voyage, on the 31st July 1498, is situated between  $10^{\circ} 2' 30''$  and  $10^{\circ} 50' 20''$  lat. North, and  $60^{\circ} 56' 35''$  and  $61^{\circ} 59' 30''$  long. West of Greenwich. Position.

It is almost of a rectangular form, nearly North and South, and East and West, with two promontories projecting from its N.W. and S.W. corners, like two arms hugging up the Gulf of Paria and stretching out westward, as if trying to reunite the island to its parent the Southern American Continent, from which it seems to have been torn off in ages gone by. Form.

It was ceded by Spain to Great Britain in 1802.

Its extreme length is about, on the North  $53\frac{1}{2}$ , and on the South 65 miles, and its breadth, Eastward  $48\frac{1}{2}$ , and Westward  $49\frac{1}{2}$  miles, and its area about 1,122,880 acres, of which about 276,000 have been alienated, but only about 92,562 are in cultivation. Dimensions.

The position of this island, opposite the Delta of the Orinoco, from which its S.W. point is only a few miles distant, renders it a natural "entrepôt" for the commerce of the western and interior parts of the neighbouring continent, and its beautiful and placid gulf, which, it has been said, could "contain all the fleets of the world" is so completely out of the range of hurricanes, as to offer the safest anchorage at all seasons of the year. Capacities for commerce.

Besides almost daily sailing communications with Venezuela, there are now two Venezuelan steamers plying regularly once or twice monthly, between the island and that republic, one going up the Orinoco, as far as Ciudad Bolivas, and the other touching at different ports on the eastern and northern coasts, as far as Laguayara, as do also monthly, one French and two English steamers. Means of communication: two Venezuelan and one French and two English steamers.

The soil of Trinidad is generally exceedingly rich and fertile, and well adapted to the cultivation of the sugar cane, cacao, coffee, cotton, coco-nuts and tropical provisions, fruits, and spices. Soil.

The island abounds in excellent timber suitable for ship building, and all sorts of "wood work," in plants yielding fibres, oils, gums, resins, and raw materials for paper making, and contains also deposits of coals, pitch, mineral oils, &c., &c. Vegetable and mineral productions.

A most promising deposit or mine of very superior pitch, valued at 20l. a ton has just been discovered in the district of Montserrat.

Mr. Guppy, in his Trinidad Almanack for the year 1877, writes as follows:—  
 "In 1797 the population was 17,718. In 1838, it had increased to 39,328, and by the census of 1871, it appeared to be 109,638, it may now (1876) be reckoned at 120,000, the trade and production of the island have increased in a greater ratio than its population, and of late years the increase has been more rapid than formerly. The average annual export of sugar for the three years 1839, 1840, 1841, was 26,856,600 lbs.; and the average annual export for the three years 1871, 1872, 1873, was about 118,930,000 lbs. Statistics of population.  
Trade.

" The average export of cacao for the years 1841, 1842, 1843, was 2,810,000 lbs., whilst for the years 1871, 1872, 1873, it was at the rate of 7,615,000 lbs. annually.

" The increase in the trade of the island may be perceived by the following figures :—

	Value of Imports.		Value of Exports.
	£		£
" 1855.	554,534	-	387,999.
" 1875.	1,507,794	-	1,625,082."

With all its natural resources of wealth, however, the Colony is far from getting an adequate return therefrom, owing to several causes, the principal of which are to be found in the general apathy and want of enterprising spirit almost inherent in the people of tropical climates (as I have already stated in my official reports on the woods of Trinidad), coupled with a sort of invincibly exclusive adherence to the old principal staples of the Colony, and, perhaps, a general want, if not of capital, at least of confidence in investing in new industries.

Attempt to introduce cultivation of cinchona.

In 1863, two plantations of cinchona were established in the mountains of Trinidad, but although the one in the heights of Aripo (one of the localities chosen) seemed at first likely to succeed, the young trees having rapidly grown to a height of over six feet, they eventually all died away, probably from want of proper attendance.

Want of interest in International Exhibitions.

The apathy alluded to above has unfortunately hitherto been but too apparent in the general lukewarmness evinced in getting the Colony creditably represented at the different International Exhibitions held in Europe and elsewhere since the year 1851.

Contributions to previous Exhibitions.

In 1851, under the government of Lord Harris, the contribution of Trinidad to the London Exhibition consisted of a few specimens of minerals, five or six different sorts of animals, vegetable and mineral oils, tortoise shells, spices, fibres, sugar, rice, cacao, chocolate, coffee, cotton, tobacco, gums and resins, medicinal products, tanning and dyeing materials, woods for ornamental and other purposes, and a few ornamental baskets and seeds, &c.

In 1854 the Colony sent a few articles to the Exhibition held at Porto Rico, but nothing to the Paris display of 1855.

At the London Exhibition of 1862, an effort was made (rewarded by seven medals and one honourable mention), to respond to the government call on the Colony, and a fair collection was forwarded, consisting of mineral, chemical, and pharmaceutical products, vegetable food, animal and vegetable substances used in manufactures, woods, &c.

At the Paris Exhibition of 1867, the contribution (which carried only two medals and one honourable mention), was sadly insignificant, and consisted merely of a collection of the publications and newspapers printed in the Colony in 1866; a series of photographs of the Botanic Gardens; specimens of raw pitch or asphalt, and of boiled pitch or asphalt spuré; 2 collections of woods, one of 75 specimens by Mr. H. Preston, the Colonial Botanist, and one of 222 by myself; a few bottles of bay rum and of scented hair oil, and one sample of cacao.

At the Vienna Exhibition of 1873, the Colony was, if possible, still worse represented, having sent only a few samples of Balata gum, cacao, asphalt, iron ore, and a collection of woods; however, one medal was awarded to the woods, and an honourable mention to the cacao.

Contributions to Philadelphia Exhibition.

The scantiness of the articles sent from the Colony to the Philadelphia Exhibition of this year (1876) sadly shows, once more, that no impetus has yet been successfully given to the public spirit of the Colonists, and that it seems almost impossible to awaken in them any interest beyond that attached to the old staples of sugar, cacao, and coffee.

The contribution to this Exhibition, so discreditable to a Colony abounding in many sources of products, only comprised some samples of Trinidad gutta percha, cacao, "resine," and molasses, sugars, bitters, carass, and cocoa nut oils, manioc and plantain flours, cassada starch, a few walking sticks, and baskets and other articles of wicker manufacture, and a collection of woods.

The "insouciance" so lamentably conspicuous in the Colonists for the development and display, at Exhibitions abroad, of the many resources of this rich and beautiful island, has been perhaps still more painfully apparent at all the local shows held since 1851. Local Exhibitions.

In that year, the governor, Lord Harris, who ever had at heart the welfare and progress of the Colony, instituted, at Port of Spain, the first local Industrial Exhibition, hoping that it might be the means of arousing the sleeping energy of the people, and thereby promoting the general prosperity of the island.

The interest taken by his Lordship seemed at first to have succeeded in stirring up the country, but it soon became evident that its effect was not to be of long duration.

Since 1851, twelve Exhibitions have taken place at Port of Spain, and two in one of the richest country districts (Couva), but they have certainly not realized the expectations founded on them, and have on the contrary discouragingly dwindled away to comparative insignificance.

One perceptible benefit however has sprung from them in the improvement of stock, particularly horses and horned cattle, and for this almost solitary boon, the Colony must ever be thankful to the founder of those shows. Effect on improvement of stock.

In 1871, the Governor, Mr. (now Sir James) Longden, struck with the unprofitable results obtained from our local Exhibitions, suggested the holding, in Trinidad, of an Intercolonial Exhibition open to *all* the West India Islands, Venezuela, and the Colonies of Guiana, and, in reply to a dispatch (2nd December 1871) from His Excellency, received the expression of the Earl of Kimberley's concurrence in the desirableness of such an Exhibition. Somehow or other however the project fell through, and no more was thought of it.

Whether the want of enterprise, so characteristic of the people here, is due to the diversity of races and nationalities forming our population, and the consequent absence of unity of purpose, or to a sort of natural moral sluggishness, a "laissez aller" resulting from the climate and the easy living here, it is unfortunately clear that the "vis inertie" opposed to all attempts at starting any new industrial movement in Trinidad, threatens long to delay the progress of the Colony. Want of individual enterprise in population.

It is, perhaps, not out of place to observe here, that no step in that direction can be expected to take place in Trinidad unless to a certain extent suggested or initiated by the Government, or at least strongly backed by it, and that the earnestness of the colonists in all such matters depends almost entirely on the interest taken therein by the Governor himself. Necessity of Government support to render projects successful.

The recently completed railway between Port of Spain and Arinca, a distance of only 16 miles, has, beyond the most sanguine expectations, suddenly raised so unhopd for a taste for travelling in this country of generally slow locomotion, that during the month of August last, upwards of 26,000 passengers have travelled by it. Introduction of railways.

It would be too long to point out here, what new branches of industry might be successfully and payingly opened in this Colony, but I may, in conclusion, express a hope that the time is not far distant when under a stirring and progressive administration, a true public spirit, worthy of this rich and nature favoured Colony, will cast off the trammels of an obsolete routine, and make determined efforts to attain to the bright future which is doubtless in store for Trinidad.

(Signed) SYLVESTER DEVENISH,  
Surveyor General.

Trinidad,  
27th December 1876.

**CATALOGUE of ARTICLES displayed at the PHILADELPHIA INTERNATIONAL  
EXHIBITION, 1876, by the GOVERNMENT of TRINIDAD.**

P. signifies Award to Exhibit.

[The Government of Trinidad received also an award for its collective exhibit.]

P	Crude asphalt as taken from the Pitch Lake, Trinidad (1 box)	} Thos. A. Finlayson, Esq., Trinidad.
	Boiled asphalt, known in commerce as asphalté epurée (1 box)	
	Glance asphalt, similar to <i>Bitumen Indiacum</i> , and commercially known as Greek pitch (1 box)	
	Surface coals from the eastern coast	Do.
	Cocoa-nuts (2 bags)	Do.
		L. A. F. André, Esq., Trinidad.
		A. Cumming and Co., Port of Spain.
P	Samples of native woods (57)	{ Hy. Prestoe, Esq., Government Botanist, Trinidad.

**AS FOLLOW :**

Common Names.	Botanical Names.	Specific Gravity.	Average Diameter of Trunk of full grown Trees.
Swamp Mahoe	<i>Pterocarpus Bohrii</i> , V.	524	2 feet 6 inches.
White Savonette	<i>Lonchocarpus latifolius</i> , Kth.	720	1 foot 6 "
Yellow do.	" <i>violaceus</i> , Kth.	929	5 feet.
Locust or Courbaril	<i>Hymenaea courbaril</i> , L.	980	2 "
Guatemare	<i>Myrospermum frutescens</i> , Jacq.	1 029	5 "
Mora	<i>Mora excelsa</i> , Benth.	—	1 foot 6 inches.
Purple heart	<i>Prioria</i> , Sp.	—	6 feet.
Saman	<i>Inga saman</i> , Willd.	—	1 foot.
Logwood	<i>Hematoxylon campeachianum</i>	992	1 "
Queenwood	<i>Bauhiola ungula</i> , Jacq.	940	1 "
Angéline	<i>Andira inermis</i> , Kth.	748	3 feet.
Stinkwood	<i>Acacia tortuosa</i> , Willd.	—	1 foot.
Cassia	<i>Cassia spectabilis</i> , D.C.	684	2 feet.
Yoke	<i>Piptadenia peregrina</i> , Benth.	1 229	3 "
Balata	<i>Mimusops globosa</i> , Gert.	1 048	4 "
Star-apple	<i>Chrysophyllum cainito</i> , Q.	839	1 foot 6 inches.
Sapodilla	<i>Achras sapota</i> , L.	—	2 feet.
Galba	<i>Calophyllum calaba</i> , Jacq.	655	4 "
Mammee Sapote	<i>Mammea Americana</i> , L.	879	2 "
Cedar	<i>Cedrela odorata</i> , L.	474	4 "
Carap or Crapaud	<i>Carapa guianensis</i> , Aubl.	689	3 "
Mahogany	<i>Sweitenia Mahogany</i> , L.	806	3 "
Black Poui	<i>Tecoma serratifolia</i> , Don.	1 215	3 feet.
Yellow Poui	" <i>spectabilis</i> , Pl.	—	2 "
Chairwood	" <i>leucoxydon</i> , Mart.	—	2 feet 6 inches.
Lezard or Fiddlewood	<i>Vitex divaricata</i> , Su.	766	3 "
Fiddlewood	<i>Citharexylon quadrangulare</i>	733	3 "
	<i>Jacaranda felicifolia</i>	652	1 foot 6 inches.
Teak (East Indian)	<i>Tectona grandis</i> , L.	—	2 feet.
Tapana	<i>Drypetes</i> , Sp.	7 73	3 "
Mahoe	<i>Sterculia caribæa</i> , R. Br.	516	2 feet 6 inches.
Almond (Tropical)	<i>Terminalia Catappa</i>	699	2 "
Mangrove—Red	<i>Rhizophora Mangle</i> , L.	1 023	2 "
Do.	Do.	—	—
Do. —White	<i>Leguncularia racemosa</i> , Sa.—Grise.	860	—
Lechero	<i>Sapium aucuparium</i> , Jacq.	489	1 foot.
Olivier or Olivewood	<i>Chuncea obovata</i> , Poir.	775	4 feet.
Pimento	<i>Myrcia acris</i> , var <i>pimentoides</i> , Grise.	990	1 foot.
Caruto	<i>Genipa Americana</i> L.	873	1 " 6 inches.
Fustic or Dyewood	<i>Maclura Xanthoxylon</i> , Endl.	711	2 feet.
Laurier Cannelle, A, B, and C	<i>Oreodaphne strumosa</i>	515	1 foot 6 inches.
Do. Blanc	" <i>leucoxydon</i> , Gr.	487	1 " 6 "
White Cypre	<i>Cordia sulcata</i> , D.C.	580	2 feet.
Black Cypre	" <i>gerascanthus</i> , D.C.	574	2 "
Corkwood	<i>Ochroma lagopus</i> , Sn.	120	2 "
Podocarpus	<i>Podocarpus salicifolius</i> , Kl.	643	3 "
Guatcare	<i>Lecythis idatimon</i> .	899	3 "
Do.	" <i>laevifolia</i> , Grise.	—	3 "
Do.	<i>Gustavia augusta</i> , L.	—	1 foot 6 inches.
Cucumber calabash	<i>Crescentia cucurbitina</i> , L.	—	1 foot.
Calabash	" <i>cujete</i> , L.	624	1 "
Gaspere	<i>Esenbeckia attenuata</i> , Grise.	1 106	6 inches.
Soap-berry	<i>Sapindus saponaria</i> , L.	720	3 feet.
Guava	<i>Psidium Guava</i> , L.	696	1 foot.
Incense wood	<i>Amyris trinitatis</i>	—	2 feet.
Wild Grigri	<i>Bactris cuesa</i> , Creng.	—	—
Pirajo	<i>Guilielmia speciosa</i> , Mart.	—	—
Mountain cabbage	<i>Euterpe oleracea</i> , Mart.	918	—
Palma-real	<i>Enocarpus Batava</i> , Mart.	—	—
Lancewood	<i>Bollinia Sieberi</i> , A.D.C.	—	1 foot.
Acoma	<i>Licania</i> , Sp.	—	—
	<i>Sideroxylon mastichodron</i> , Jacq.	1 003	1 " 6 inches.

## 7. Samples of Woods\* (235)

{ Syl. Devenish, Esq.,  
Surveyor - General,  
Trinidad.

AS FOLLOW :—

Common Names.			Scientific Names.	Families.
English.	French.	Spanish.		
Acacia -	Acacia -	Aroma -	Acacia Farnesiana -	Mimosæ.
Acoma or mastic -	Acoma -	Acoma -	Mimusops sp. -	Sapotacæ.
Allspice or pimento -	Bois d'inde -	Pimientillo -	Pimenta vulgaris -	Myrtacæ.
Angelin -	Angelin -	Lombricero -	Andira inermis -	Leguminosæ.
Balata or Bullet tree.	Balata -	Purgo -	Achras balata vel mimusops globosa.	Sapotacæ.
Balsam capivi -	Copahu -	Palo de Aceite -	Copaifera officinalis -	Leguminosæ.
-	Bois Côtelette -	-	Citharexylon quadrangulare	Verbenacæ.
-	Bois pois blanc -	C. de Burro -	Swartzia pinnata vel cynometra cauliflora.	Leguminosæ.
-	Bois gris -	Cace -	Licania incana -	Chrysobolanæ.
Bloodwood -	Bois sang -	Lacre -	Vismia Cayennensis -	Hypericacæ.
Bread fruit -	Arbre à pain -	Pan del ano -	Artocarpus incisa†	Artocarpeæ.
Crapo -	Crapo -	Carapo -	Carapa Guianensis -	Meliacæ.
Calabash -	Calebassier -	Totumo -	Crescentia Cujete -	Crescentiacæ.
Wild calabash -	Calebassier Sauvage.	Totumo del Monte.	Crocentia latifolia -	Id.
Caracas tree -	Zaman -	Zaman -	Calliandra Zamant -	Leguminosæ.
Cedar -	Acajou -	Cedro -	Cedrela odorata -	Cedrelacæ.
Cocoa-nut -	Cocotier -	Coco -	Cocos nucifera -	Palmacæ.
Cyp -	Cyp -	Pardillo -	Cordia gerascanthus -	Cordiaceæ.
Fustic -	Bois d'Orange -	Palo Naranjo -	Maclura xanthoxylon -	Urticacæ.
Galba -	Galba -	Palo Maria -	Calophyllum Calaba -	Clusiaceæ.
Gasparillo -	Gasparil -	Gasparillo -	Esenbeckia castanocarpa -	Diosmæ.
Genipa -	Genipa -	Caruto -	Genipa Americana -	Rubiaceæ.
Gominier -	Gommier -	Carano -	Icica carana -	Terebinthacæ.
Governor's plum -	Prunier Gou-verneur.	-	Flacourtia Ramontchit -	Flacourtiaceæ.
-	Chaconia on Cacao Marron.	Guacamaya -	Warsceviczia coccinea, V. calicophyllum coccinea.	Rubiaceæ.
Guatécara -	Guatécara -	Guatécara -	Lecythis idatimon -	Lecythidacæ.
Guava -	Goyavier -	Guayava -	Psidium pyrifera -	Myrtacæ.
Hickory (Trinidad) -	Bois pois noir -	Palo de rosa -	Brownea coccinea -	Leguminosæ.
Hoplum -	Mombin -	Jovo -	Spondias Mombin -	Terebinthacæ.
Laurel -	Laurier -	Laurel -	Laurus -	Laurinæ.
Laurel cyp -	Laurier Cyp -	Idem -	-	Id.
Letter or Leopard wood.	Gatia -	Gateado -	Brosimum Guianensis -	Artocarpeæ.
Lignum Vitæ -	Galac -	Guayacan -	Gualacum officinale -	Xanthoxyleæ.
Lime tree -	Citronnier -	Limon -	Citrus limonum -	Aurantiacæ.
Locust -	Coubaril -	Algarrobo -	Hymenæa Courbaril -	Leguminosæ.
Logwood -	Campêche -	Campêche -	Hæmatoxylon Campechia-num.	Id.
-	Macata -	Cascabelillo -	Poinsettia pulcherrima -	Id.
Mammee Apple -	Abricotier -	Mamey -	Mammea Americana -	Clusiaceæ.
Manchineel -	Mancenilier -	Manzanillo -	Hippomane mancinella -	Euphorbiacæ.
Mangrove (button) -	Mangle roche -	Mangle boton-cillo.	Conocarpus erecta -	Combretacæ.
Monkey Balata -	Balata Macaque -	Purgo Macho -	Conarus -	Sapotacæ.
Monkey Bones -	Os Macaque -	-	-	Myrtacæ.
Mora -	Mora -	Muro -	Mora excelsa -	Leguminosæ.
Moussara or Breadnut.	Moussara -	Musara -	Brosimum alicastrum -	Urticacæ.
Murraja -	Murraja -	Citronera -	Murraja exotica -	Aurantiacæ.
Satin wood -	Noyer -	Nogal -	Xanthoxylum sp. -	Terebinthacæ.
Olivier -	Olivier -	Acetitunillo -	Chuncoa obovata -	Combretacæ.
-	-	Pata de Vaca -	Bauhinia grandiflora -	Leguminosæ.
Poul (black) -	Poul -	Pul -	Tecoma serratifolia -	Bignoniaceæ.
Purple heart -	Sapater -	Zapatero -	Peltogyne paniculata -	Leguminosæ.
Red Mangrove -	Mangle rouge -	Mangle Colorado -	Rhizophora Mangle -	Rhizophoracæ.
Redwood -	Bois rouge -	Cabimbo -	Trichilia Moschoxylon -	Meliacæ.
Roble -	Roble -	Roble -	Platymiscium polystachium	Leguminosæ.
Sapodilla -	Sapotillier -	Nispero -	Achras Sapota -	Sapotacæ.
Savana Yoko -	Yoko Savane -	Yopo de Savana -	Piptadenia peregrina -	Mimosæ.
Savonette (yellow) -	Savonnette jaune -	Conure -	Lonchocarpus latifolia -	Leguminosæ.
Sea Side grape -	Raisinier du bord de Mer.	Uva de playa -	Coccoloba Uvifera -	Polygonacæ.

\* Including a few not indigenous but thriving well in the Island.

† Not indigenous.

Common Names.			Scientific Names.	Families.
English.	French.	Spanish.		
-	Surette des grands bois.	Murecho man-tequero.	Byrsonima spicata -	Malpighiaceæ.
Tamarind -	Tamarinier -	Tamarindo -	Tamarindus indica -	Leguminosæ.
Tapana -	Tapana -	Tapanaro -	Stillingia -	Euphorbiacæ.
-	Tendre à Caillou	Charo -	Mimosa lithoxylum vel Pithecolobium filicifolium.	Mimosæ.
-	Mahaut de Londres.	-	Thespesia populnea -	Malvaceæ.
Wild Tamarind -	Bois Mulâtre -	Palo Mulato, ô clavellino.	Pentaclethra Filamentosa -	Leguminosæ.
White Mangrove -	Mangle blanc -	Mangle Blanco -	Laguncularia racemosa -	Verbenacæ.
Yoke -	Yoke -	Yopo -	Astronium obliquum -	Leguminosæ.
Cashew tree -	Pommier d'Acajou	Merey -	Anacardium occidentale -	Anacardiaceæ.
Yellow Sanders -	L'Epineux	Mapurito, ô Espina de bobo.	Xanthoxylum clava Herculis	Xanthoxylacæ.
Surinam or Cayenne Cherry.	Ceriser de Cayenne.	-	Eugenia Mitchelli -	Myrtacæ.
Mango tree -	Mangotier -	Mango -	Mangifera indica -	Terebinthacæ.
-	-	-	Jacaranda cerulea vel felicifolia.	Bigniacæ.
-	Guatamare -	Guatamare -	Myroserpium frutescens -	Leguminosæ.
Guenepé -	Guenepé -	Maco -	Melicocca Bijuga -	Sapindacæ.
Avocado pear -	Avocatier -	Aguacate -	Persea gratissima -	Laurinæ.
Wild Angelin -	Angelin de Grands Bois.	Lombricero del Monte.	Diploctropis brachypetal -	Leguminosæ.
Scotch friend -	Matapalo -	Matapalo -	Ficus -	Artocarpæ.
Akee -	Eis de Veau Vegetal.	-	Akoesia (Blighia sapida)*	Sapindacæ.
Mammee sapote -	Sapote -	Maney Colorado	Lucuma Mammosa -	Sapotacæ.
Bitter ash -	Quassia -	-	Quassia Amara -	Simarubacæ.
Rough leaf -	Feuille rude -	Chaparro -	Curatella Americana -	Dilleniaceæ.
Blood wood -	Bois Sang -	Palo de Sangre	Crotona gossypifolium	Euphorbiacæ.†
Sandbox (white) -	Sablier blanc -	Javillo Blanco -	Lucca Crepitans -	Id.
Contrevent -	Contrevent -	-	Lucuma multiflora -	Sapotacæ.
Frangipani -	Frangipani -	-	Plumeria -	Apocynacæ.
Cassia (long) -	Cassier punant -	Aleluya -	Cassia brasiliensis -	Leguminosæ.
-	Quashy-Quasha -	-	Thevetia nerifolia -	Apocynacæ.
Malacca apple -	Pommier Malaque.	-	Eugenia Malaccensis*	Myrtacæ.
Pandanus -	Pandane -	-	Pandanus candelabrum*	Pandanacæ.
Bermuda cedar -	Cèdre des Bermudes.	-	Juniperus Bermudiana*	Conifereæ.
Fiddle wood -	Bois lézard -	Totumo Guaray	Vitex capitata -	Verbenacæ.
Grugru -	Grougrou -	Corozo -	Acrocomia sclerocarpa -	Palmeacæ.
Pois doux -	Pois doux -	Guámo -	Inga vera -	Mimosacæ.
Mabolo -	Mabolo -	Mabolo -	Diospyros Mabolo -	Ebenacæ.
-	-	-	Pisonia sp. -	Nyctaginæ.
White wood -	Poirier de la Martinique.	Roble blanco -	Tecoma pentaphylla*	Bignoniaceæ.
-	Bois Canari -	-	-	-
Royoc -	Royoc -	Cauto -	Hirtella silicea -	Chrysobolanæ.
Beef wood -	Aguatapana -	Royoc -	Morinda -	Rubiaceæ.
Grugru -	Grugru -	Aguatapana -	Rhopala Montana -	Protacæ.
Incense tree -	Bois d'encens -	Corozo -	Astrocaryum -	Palmeacæ.
-	-	Curucay -	Icica heptaphylla vel Amyris Trinitensis.	Amyridæ.
Star Apple -	Calmitier -	Cainito -	Chrysophyllum cainito -	Sapotacæ.
Noyau -	Noyau -	-	Prunus occidentalis -	Drupacæ.
Sea side almond -	Amandier du bord de mer.	Almendron de playa.	Terminalia sp. -	Combretacæ.
-	Poirier -	-	Id.	Id.
Black Mangrove -	Mangle noir -	Mangle Jari -	Avicennia nitida -	Id.
-	Pois doux maron.	-	-	Leguminosæ.
-	Iacque des Grands Bois.	-	Chrysobolanus pellocarpus -	Chrysobolanæ.
-	Bois Caralbe -	Cometure -	Campomanesia aromatica -	Myrtacæ.
Stave wood -	Raisnier des Grands Bois.	Uvero del monte	Coccoloba latifolia -	Polygonacæ.
Wild nutmeg -	Muscadier Sauvage.	-	Rheedia lateriflora -	Guttifereæ.
Garlic pear -	Tocque -	Toco -	Cratæva gynandra -	Capparidacæ.
Cocorite -	Cocorite -	Cucurito -	Maximiliana insignis -	Palmeacæ.
Rose Apple -	Pomme Rose -	Poma rosa -	Janibosa vulgaris -	Myrtacæ.
-	Bouix -	-	Chrysophyllum glabrum -	Sapotacæ.
Mountain Cabage.	Palmiste -	Chaguaramas -	Oreodoxa regia -	Palmeacæ.
-	-	-	-	-
Savana Cyp -	Cyp Savana -	Pata de Vaca -	Bauhinia variegata -	Leguminosæ.
-	Pain d'épice -	Alatrique -	Cordia sulcata -	Cordiacæ.
-	Surette -	-	Cicca disticha -	Sapotacæ.
-	-	-	-	Euphorbiacæ.

\* Not indigenous.

Common Names.			Scientific Names.	Families.
English.	French.	Spanish.		
Cloves - -	Giroflier - -	Clavo de especie	<i>Caryophyllus Aromaticus*</i>	Myrtaceæ.
Nutmeg - -	Muscadier - -	Nuez de Moscada.	<i>Myristica aromatica*</i>	Myristicæ.
Queen of Flower	- -	- -	<i>Lagerströmia regina*</i>	Leguminosæ.
Mahogany - -	Acajou St. Dominique.	Caoba - -	<i>Swietenia Mahogani*</i>	Id.
Acacia - -	Acacia - -	Arôma, ô Guatéro.	<i>Acacia tortuosa</i>	Mimosæ.
Corkwood - -	Bois Flot - -	Tacargua - -	<i>Ochroma Lagopus</i>	Bombacæ.
Elm (Trinidad)	Bois d'orme - -	Guázumo - -	<i>Guazuma ulmifolia</i>	Byttneriacæ.
Yellow Mangrove	Mangle jaune - -	Mangle Amarillo	<i>Avicennia Tomentosa</i>	Verbenacæ.
Voavanga - -	Varvanguier - -	Voa Vango - -	<i>Vangueria commersoni*</i>	Cinchonacæ.
- -	Bois cendre - -	Conizeiro, ô marenjon.	<i>Peridium</i>	Euphorbiacæ.
- -	Caco marron - -	Camellon - -	<i>Amaionia</i>	Rubiaceæ.
- -	- -	- -	<i>Phoberos</i>	Flacourtiacæ.
Mahoe - -	Mahault - -	Mahagua - -	<i>Heliocarpus Americana</i>	Malvacæ.
Fig tree - -	Figuier - -	Lechero ô Atagua	<i>Ficus radula</i>	Urticacæ.
Custard apple - -	Cachiman - -	Corazon - -	<i>Anona reticulata</i>	Anonacæ.
- -	- -	- -	<i>Rollinia multiflora</i>	Id.
- -	- -	- -	<i>Pereksia</i>	Cactacæ.
Black sage - -	Bois Nègre - -	Cariaquita negra	<i>Cordia sp.</i>	Cordiacæ.
- -	- -	- -	<i>Stereospermum chelonides*</i>	Bignoniacæ.
Cannon ball or bombshell tree.	Pied poule - -	Cachicamo - -	<i>Psychotria</i>	Rubiaceæ.
- -	Arbre à bombes	Múco - -	<i>Couroupita Guianensis</i>	Lechythidacæ.
- -	Bâtard bois-cannon ou Lentille.	Higuereton - -	<i>Paux marattoni</i>	Araliacæ.
Fig tree - -	Figuier - -	Lechero - -	<i>Ficus sp.</i>	Urticacæ.
Almond tree - -	Amandier - -	Almendron - -	<i>Terminalia Catappa</i>	Combretacæ.
- -	Bois charbon - -	Bayo de Antigua	<i>Diospyros sp.</i>	Ebenacæ.
- -	Moricyp Jaune - -	- -	- -	Cordiaceæ.
- -	Bois rivièr - -	Juáldo - -	- -	- -
- -	Bois Canique - -	Naranjillo - -	<i>Maba inconstans</i>	Ebenacæ.
Seaside plum	- -	- -	<i>Ximenia Americana</i>	Oleacæ.
Cocoa plum or fat pork.	Icaque - -	icacos - -	<i>Chrysobolanus icacos</i>	Chrysobolanæ.
Seaside mahoe - -	Mahault du bord de Mer.	Caigua - -	<i>Paritium tiliaceum</i>	Malvacæ.
Orange tree - -	Oranger - -	Naranjo - -	<i>Citrus Aurantium</i>	Aurantiacæ.
- -	Chaparro à feuille lisse.	- -	<i>Bunchosia</i>	Malpighiacæ.
Cocoa tree - -	Cacnotier - -	Palo de Cacao - -	<i>Theobroma Cacao</i>	Byttneriacæ.
Débasse - -	Débasse - -	Canilla de Venado.	<i>Calyptranthes sericea</i>	Myrtaceæ.
- -	Bois baguette - -	Punteral - -	<i>Myrinda</i>	Rubiaceæ.
- -	Bois de Morue - -	Siete capas - -	<i>Machoeium</i>	Leguminosæ.
Wild Cocoa - -	Bois Cacao - -	Uvero del Monte	<i>Coccoloba sp.</i>	Polygonacæ.
- -	Bois patate - -	Nauve - -	<i>Calliandra sp.</i>	Leguminosæ.
- -	- -	Almendron del Monte.	- -	Chrysobolanæ ?
Piroa - -	Piroa - -	Pijikua - -	<i>Gulielma sp.</i>	Palmacæ.
- -	- -	Palma real ô Yagua.	<i>Enocarpus Batawa</i>	Palmacæ.
Coffee tree - -	Cafer - -	Café - -	<i>Coffea Arabica*</i>	Rubiaceæ.
- -	- -	Naranjillo - -	<i>Swartzia grandiflora</i>	Leguminosæ.
Wild Chestnut - -	Chataignier - -	Castano - -	<i>Podocarpus salicifolius</i>	Coniferæ.
- -	- -	C. de burro - -	<i>Pachira aquatica</i>	Bombacæ.
White cedar - -	Acajou Marron - -	Cayuca ô anakin	<i>Saccoglottis Amazonia</i>	Styracæ.
- -	Bois bari - -	Pama - -	<i>Myristica sp.</i>	Myristacæ.
Bird lime tree - -	Bois lait - -	Lechero - -	<i>Pisonia inermis</i>	Nyctaginæ.
- -	Campêcho bord de mer.	- -	<i>Sapium Aucuparium</i>	Euphorbiacæ.
- -	Bois l'étang - -	Lagunero - -	<i>Pithecolobium vel calliandra sp.</i>	Leguminosæ.
- -	Coco Macaque - -	- -	<i>Pterocarpus Draco</i>	Id.
Laurel - -	Laurier Avocat - -	Laurel - -	?	Sapindacæ.
Wild Savonette - -	Savonette Blanc - -	Conure blanco - -	<i>Macherium sp.</i>	Laurinæ.
- -	Bois caco - -	Cacao del Monte Macho.	<i>Isertia parviflora</i>	Leguminosæ.
Thorn of yellow sanders.	Piquant de Epineux. - -	Espina bobo - -	<i>Xanthoxylon Clava Herculis</i>	Rubiaceæ.
Gri gri - -	Gri gri - -	Maraval - -	<i>Martinezia caryothefolia</i>	Xanthoxylacæ.
Arnotto - -	Roucou - -	Onoto - -	<i>Hixa Orellana</i>	Palmacæ.
- -	Mahault Charodon.	Tumboal - -	<i>Apeiba Aspera</i>	Bixacæ.
Yellow sandbox - -	Sablier jaune - -	Javillo Amarillo	- -	Tiliacæ.
- -	Bois Anoli - -	- -	<i>Hura Crepitans</i>	Euphorbiacæ.
- -	Cacapoule - -	- -	<i>Faramca guianensis</i>	Malpighiacæ.

\* Not indigenous.

Common Names.			Scientific Names.	Families.
English.	French.	Spanish.		
-	Cupey	Cupey	<i>Clusia rosea</i>	Clusiaceæ.
-	-	-	<i>Ilex Macoucoua</i>	Illiciaceæ.
-	-	Mamoneillo	<i>Casearia</i>	Samydaceæ.
-	-	Yema de huevo	-	-
Mawbee stick	Bois Costière	Bijaguara	<i>Colubrina reclinata</i>	Rhamnaceæ.
Sugar apple	Pomme Cannelle	Anon	<i>Anona Squamosa</i>	Anonaceæ.
Wild coffee	Café Marron	Café del Monte	<i>Coffea</i> sp.	Rubiaceæ.
-	-	-	Mollinedia	Monimiaceæ.
-	-	Cauturo	<i>Parinium Campestre</i>	Chrysobalanaceæ.
-	-	Naranjillo de rio	-	Ebenaceæ.
-	-	Sardino Arima	-	Samydaceæ.
-	Mabouya	-	<i>Capparis Cynophallophora</i>	Capparidaceæ.
-	Poul Mme. Jean	-	<i>Olyanthus Condensata</i>	Compositæ.
-	Bois flambeau	-	<i>Tecoma Stans</i>	Bignoniaceæ.
Olive wood	Bois d'Olive	-	<i>Capparis jamaicensis</i>	Capparidaceæ.
-	Petit baume	-	<i>Croton</i> sp.	Euphorbiaceæ.
-	Bois Miel	-	-	Myrtaceæ.
-	Noyer (Chacachacareo Island).	-	-	Samydaceæ.
-	-	Algarrobo	-	Polygonaceæ.
Cactus	Cactus	-	<i>Cactus heptagonus</i>	Cactaceæ.
Dividivi	Dividivi	Dividivi	<i>Cæsalpinia Coriaria</i>	Leguminosææ.
-	Bois mal d'estomac.	Gualulo	-	Piperaceæ.
-	-	Barbasco	<i>Jacquinia armillaris</i>	Myrsinææ.
-	-	Inagua	-	Myrtaceæ?
-	-	Sardino blanco	<i>Miconia prosina</i>	Melastomaceæ.
-	Bâtard bois	-	<i>Sponia</i>	Urticaceæ.
-	l'orme.	-	-	-
-	-	Maraquire	<i>Ratonia Americana</i>	Sapindaceæ.
-	-	Aquirire	-	Meliaceæ.
-	-	-	<i>Cordia</i> sp. (red flowers) *	Cordiaceæ.
-	Avocat Marron	-	<i>Ruprechtia</i> sp.	Polygonaceæ.
-	Moricyp rouge.	-	-	-
-	Cerisier	Cereza	<i>Pholacilla trifoliata</i>	Meliaceæ.
Cherry wood (from Chacachacareo Island).	-	-	-	-
-	-	-	<i>Aspidosperma</i>	Apocynaceæ.
-	-	-	<i>Solanum Callicarpifolium</i>	Solanaceæ.
-	Bois lesserre	Palo morocol.	-	-
-	Raisinier	Cuchapo	<i>Coccoloba</i> sp.	Polygonaceæ.
Jackwood	Jacquier	-	<i>Calliandra</i> sp.	Leguminosææ.
Chigoeewood	Bois nègresse	Mangle dulce	<i>Artocarpus integrifolia</i> *	Artocarpeæ.
-	-	C. de verasco	<i>Bravaisia floribunda</i>	Acanthaceæ.
-	-	-	<i>Tabernaemontana</i>	Apocynaceæ.
Supple Jack	Liane persil	Bejuco Mulato	-	Myrsinææ.
-	-	-	<i>Seriana</i> sp.	Sapindaceæ.
-	-	-	<i>Lagerströmia indica</i> *	Lythraceæ.
-	Quinquina pays	-	<i>Citriosma</i>	Montiaceæ.
-	-	-	<i>Coutarea speciosa</i>	Cinchonaceæ.
-	-	-	<i>Randia</i> sp.	Id.
Mangotin	Mangotine	Mangotina	<i>Melastoma</i> sp.	Melastomaceæ.
-	-	-	<i>Mangifera</i> sp.	Terebinthaceæ.
-	-	-	<i>Ebenacea</i> sp., from Caroni & Chaguana.	Ebenaceæ.
Immortal tree	Immortelle	Quiebra hacha	<i>Copaifera hymenifolia</i> *	Leguminosææ.
-	-	Bucaro or madre del cacao.	<i>Erythrina</i>	Papilionaceæ.
-	-	-	-	-
-	-	-	<i>Posoqueria Longiflora</i>	Cinchonaceæ.
-	-	-	Alchorneo.	-
Timit	Timite	Timite	<i>Manicaria saccifera</i>	Palmaceæ.
-	-	-	<i>Casuarina Equisetifolia</i> *	Equisetaceæ.

\* Not indigenous.

Balata gum or Trinidad gutta percha (liquid), } Government of Trinidad.  
 2 demijohns (solid), 6 cakes - }  
 3 razor strops (made of *Agave Vivipara*) - } Syl. Devenish, Esq., Surveyor  
 1 Gourd calabash - - - - - } General.  
 Cocoa (1 bag) - - - - - } Do.  
 Cocoa (1 box) - - - - - } Sir Joseph Needham, San  
 - - - - - } Antonio, Trinidad.  
 - - - - - } Jos. Penco, Esq., La Merced,  
 - - - - - } Trinidad.  
 Cocoa (2 bags) - - - - - } C. Cleaver, Esq., Verdant Vale,  
 - - - - - } Trinidad.

Cocoa (1 bag)	-	-	-	-	{ St. L. D'Abadie, Esq., St. Pe-
Snuff made of native tobacco	-	-	-	-	dro, Trinidad.
Nutmegs—1 bottle fresh—perfect fruits	-	-	-	-	Mrs. C. Flament.
Do. 1 " prepared "	-	-	-	-	{ Hy. Prestoe, Esq., Govern-
Cloves 1 " fresh, flower buds	-	-	-	-	
Cloves and nutmegs, 1 bottle mixed, fresh	-	-	-	-	
Mace, 1 bottle prepared	-	-	-	-	
Sample of fibre extracted from the huaks of the cocoa-nut, adapted for making brooms, brushes, &c., value about \$250 per ton	-	-	-	-	{
Sample of ditto adapted for upholstery and bedding, value about \$110 per ton	-	-	-	-	
Coil of the above spun	-	-	-	-	Do.
Samples of fibre of <i>Agave Vivipara</i> and of mats made thereof	-	-	-	-	Do.
☛ Fibres—various kinds in 20 samples	-	-	-	-	{ Syl. Devenish, Esq., Sur- veyor General.
					{ Hy. Prestoe, Esq., Govern- ment Botanist.

as follow:—

- No. 1.—*Sida carpinifolia*. L. Malvaceæ.
- " 2.—*Urena lobata*, L. "
- " 3.—*Sida rhombifolia*, L. "
- " 4.— " *linifolia*, Juss. "
- " 5.—*Pavonia bracteata*, Benth. "
- " 6.— " *racemosa*, "
- " 7.—*Malvaviscus indicus*, L. "
- " 8.— " *sp.* "
- " 9.—*Sterculia caribæa*, R. B. Sterculiaceæ.  
Bass from trunk.
- " 10.—*Hibiscus Rosa-simensis*. Malvaceæ.  
Bass from matured branches.  
Fibre from young branches.
- " 11.—*Musa paradisiaca*, L.  
Fibre from outer leafstalks—uncombed.  
Do. do. —roughly combed.  
Fibre from inner leafstalks—uncombed.  
Do. do. —roughly combed.
- " 12.—*Musa textilis*.
- " 13.— Sample—rough.
- " 14.— Do. —combed.
- " 15.—*Musa sapientum*.
- " 16.— Do. do. variety "Yellow fig."
- " 17.— Do. *cavendishii*.
- " 18.—*Fourcroya gigantea*, sample prepared in 1866.  
Do. do. in 1875.
- " 19.—*Bromelia karatas*, L.
- " 20.—*Theobroma cacao*, L.

Remarks.—These fibres, with one or two exceptions as specified, were all prepared in 1866.

They are to be regarded as of two classes:—

First.—Those obtained from the bark of the plant, as in hemp, flax, &c.; and

Second.—Those obtained from the substance of the leaves or leafstalks, as in "Manilla," hemp, &c.

Nos. from 1 to 11, and No. 20 belong to the first class—the first four being obtained from the bark of the entire plant; 5, 6, 7, 8, and 20 are obtained from the younger branches; and No. 9, from the trunk of the tree.

Nos. 12 to 19 belong to the second—12, 13, 14, 15, and 16 being obtained from the leafstalks (forming the stem in the plantain), and 17, 18, and 19 being obtained from the leaves.

The colour and strength of the fibres depend much on the manner of preparing them, but with very ordinary care they can be brought out of extraordinary strength and of snowy white, or golden yellow, by simple maceration.

The size, strength and colour of the fibre appear not to vary in branches or stems of different ages in Nos. 1 to 4, but in Nos. 5 to 11 these characters vary in growths of different ages, being fine and silk-like in the younger, and coarse, and easily separable in plaits as "bass" in the older branches and stems. In No. 9, the bark of the young branches reaches a maximum degree of coarseness and is scarcely useful; but the bark of the matured branch or trunk furnishes an exceedingly fine and

abundant "bass," well adapted for any purpose to which such an article is usually applied.

Of the foregoing, Nos. 1 to 6, and 9, 11, 17, and 20 are indigenous to Trinidad, and very hardy and abundant. The others are introduced plants, but all are completely naturalised; some, such as the variety of *Musa Paradisiaca* known here as the "Jumbée Plantain" and *Sansievera*, have become wild plants.

H. PRESTOE,  
Government Botanist.

Sugar (1 box) manufactured at Usine (Central Factory) St. Madelaine, Trinidad, W.I., the property of the Colonial Company, Limited, 16, Leadenhall Street, London. Manufactured direct from canes cut on the same day. The juice is first treated with temper lime in the clarifiers, subsided, passed through animal charcoal, then evaporated to syrup in the "triple effet," passed a second time through the charcoal boiled to sugar in vacuum pan, and finally cured in Weston's (American) Patent Centrifugals -				Colonial Company's Agency, Trinidad.
Molasses sugar (1 box) manufactured at the same "Usine" from the molasses obtained from the above. The molasses is pumped as fast as it proceeds from the centrifugals into tanks, where it is heated and slightly reduced in density by means of open steam, and is then boiled in vacuum pans and cured in centrifugals -				
"Angostura Bitters," manufactured by Dr. J. G. Siegert at Port-of-Spain, Trinidad (4 cases) -				Dr. Siegert, Port-of-Spain.
Cassarip	-	-	-	Government of Trinidad.
Farine manioc	-	-	-	Mrs. Ch. Flament.
Farine manioc	-	-	-	Miss Jenny.
Plantain flour	-	-	-	Mrs. C. Flament.
Cassada starch	-	-	-	Mrs. C. Flament.
Carap oil	-	-	-	Syl. Devenish, Esq., Surveyor-General.
Cocoa-nut oil	-	-	-	Messrs. Somes & Co.
Walking sticks - - - - -				Syl. Devenish, Esq., Surveyor-General.
Collection of baskets:—ten Indian baskets; nest of six fancy baskets; miniature egg baskets; fans; "Guayares" miniature strainers as used for preparing cassava; miniature "Guayares" used by men for carrying loads; miniature cataures used by women for carrying loads; mats; rice and coffee fans -				Government of Trinidad.
Baskets made of the towel gourd - - - - -				Miss Venus McAdam.

## REMARKS ON THE COLLECTION OF NATURAL WOODS.

This collection of Trinidad woods includes nearly all which, being known and considered of sufficient value, are used in the general building, carpentering, and cabinet-making in the island. It includes also several excellent woods which, being either unknown or not having been put to uses for which they are adapted, are considered by the Trinidad woodmen and carpenters as of no value. In this latter class may be mentioned Mahoe, Savonettes, Caruto, Incense-wood, &c. On the other hand there are a few excellent woods occasionally used in different parts of the island which are not represented in the collection, such as "Roble," "Black Olivier," "Copaivy," and one or two other kinds of "purple heart." Several kinds of hard wood yielded by trees of small size and used by the peasantry in framing their "trash" houses are also not included. The mahogany, teak, and jacaranda are not indigenous, but are quite naturalized.

The collection might have been increased to the extent of 20 to 25 examples representing timber trees of large size and first class quality which are totally ignored by the woodmen of the colony, either on the ground of hardness, irregularity of grain, or non-durability of the wood.

Many of the samples in this collection are not large enough to afford any idea of the grand dimensions commonly attained by their species, or, indeed, by the majority of our fine timber trees. The best specimens even, such as those of the cedar, mahogany, angelina, fustic, &c., are deficient in this respect, and therefore particular attention is directed to the column of dimensions commonly attained, introduced into the list in the Catalogue.

The large extent of unbroken forest in Trinidad and the variety and abundance of useful timber as well as of other valuable products therein, warrant further remark more directly relating thereto.

The character of Trinidad forest vegetation is generally mixed; and, except in the swamps and natural Savannas—of comparatively small area, is unbroken. In some districts a certain species, or two or three species, may largely predominate, but the gregarious character, so common in temperate regions, is exhibited here only in the gigantic Mora. This species abounds on the south-west corner of the island, and thence in breaks of many square miles stretching across the country north-eastward. The other trees which most nearly become gregarious are the Balatas, Caraps, and various species of Ficus. The Balatas are generally confined to the sandy or gravelly districts in the flat country, and the lower stony hills of the eastern portion of the northern range. The Caraps are generally confined to districts where the soil is either very good or well watered, and occur most abundantly in the neighbourhood of or mixed with the Moras. Many species of Ficus are common everywhere, but toward the centre of the island they become almost gregarious and assume dimensions to rival the Moras. This wood—most remarkable in several species for the extreme density and toughness of grain—is never employed. The india-rubber and gutta-percha trees are not utilized as they might be, although they could be made to yield their products in almost incalculable quantity.

The trees which may be ranked next to the more or less gregarious, and which with them may be considered trees of the first class, are the Locusts, Copaiyvs, Cedars, Oliviers, and Galbas; although never gregarious, these occur so plentifully in some districts as to be "the commonest trees of the quarter."

The Moras (if of any size seldom touched by the axe), Locusts, Oliviers, and Copaiyvs (one of the "purple hearts") are often so gigantic as to be beyond the power of the woodman to reduce, except by fire.

The most important of the timber trees which are alluded to in the foregoing as unappreciated, and therefore unapplied, are the myrtles, commonly known, particularly in Jamaica, as "Zebra and Leopard" woods. They abound in all parts of the island, and rank with timber trees of second size, such as Caraps, Pouis, Acomas, &c., and are almost always well grown and sound. The

formation of the trunk is unique; the influence of the contortion of the grain set up in the trunk at the very infancy of the tree by twig branches which at length fall and are superceded in course of further development, continues and increases with age; the result is the most beautiful and varied grain, in exceedingly strong and dense wood.

Next to these may be mentioned the iron-woods (*Chrysobalanæ*) of which an example was shown at the Philadelphia Exhibition. Several species, like the *Parinari campestre* and *Licania silicia*, in respect of size rank with the trees of the first class. These woods too, are largely siliceous, and much on this account, as well as from the uniform density of the wood, they are avoided by the woodman.

Of the neglected light or "soft" woods the Mahoes (*Sterculia Caribæa*), Lancewoods (*Rollinias*), Wild Chest-nuts (*Paschira*), Swamp Mahoe (*Pterocarpus*), some Laurels (*Phæbe Oreodaphne Ayedendron*), and "Bois d'Orme" or Elms (*Guazuma*) may be mentioned as the most important. Their bad reputation has arisen chiefly from the absurd and deeply rooted notion that wood cutting should be guided by the phases of the moon. The majority of these trees are deciduous and shed their leaves twice a year—some do so three times, this indicates that there are seasons at which they are in much more active growth, and absorb moisture very much more largely than at others. Thus there are periods of absorption and periods of elaboration, and the tree is correspondingly "sappy" and liable to rot, and sapless and dry (i.e. composed of completed wood tissue, and therefore fit for felling. In trees with more evergreen habit, the periods of absorption and elaboration are less marked, such trees are *always* elaborating, and thus felling them out of season is less disastrous. The fact of the cedar being a deciduous tree, and affording very valuable wood at whatever moon it may be cut, seems at first sight contradictory of this argument; but it must not be forgotten that this is a highly resinous tree, and the growth being outward—as in all exogenous trees, the thin "sapwood" is the only part affected—which every one knows decays rapidly. The *inner* wood has its cells lined with resin which prevents the ingress of moisture on the absorption of new sap.

Thus, some trees, specially deciduous ones, having seasons of very active absorption and of elaboration, the latter must be taken for felling when durable wood is required. The woodman observing the moon—*any* failing moon being considered good—has ten chances against him of hitting the right month, for the period of rest—i.e. sap, fully elaborated—is seldom more than a month, and thus he has long ago received the false conviction that certain woods are useless.

Finally, but not of least importance, are the timber-producing palms which abound in almost all parts of the island—unappreciated from their abundance. The beautiful and rare porcupine wood obtained from a short portion of the foot of the coco-nut palm is well known, and the samples of palm woods exhibited must be classed with it. The four kinds which were exhibited may be obtained in practically unlimited quantity in lengths of 10 or 12 feet. They are eminently suitable for interior decorative work, as pillars, &c., of high class buildings. They rival ebony for hardness, polish easily, and are unique in respect of grain. Specimens shown—the hollow ones having been filled with pitch and sawdust, or charcoal and sawdust, have been used as posts in an exposed gallery for over six years, and promise to be exceedingly durable.

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